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Lumleian Lectures

[ABRIDGED]

ON

ENCEPHALITIS LETHARGICA (EPIDEMIC ENCEPHALITIS).

Delivered before the Royal College of Physicians of London on March 15th, 20th, and 22nd, 1923,

BY ARTHUR J. HALL, M.A., M.D. CAMB., F.R.C.P. LOND.,

PROFESSOR OF MEDICINE, UNIVERSITY OF SHEFFIELD; SENIOR PHYSICIAN, SHEFFIELD ROYAL HOSPITAL.

LECTURE I.

IN choosing a title for these lectures it seemed best to retain the two names which alone have survived amongst the many suggested for this disease. The name encephalitis lethargica survives chiefly from reasons of sentiment, since it is the one selected by von Economo.[1] By retaining it we pay tribute to his remarkable work; a work rendered even more remarkable by the fact that it was carried out at the height of a great war, under all the difficulties which that involved. In this country the name is at present the one under which official notification must be made, and its temporary retention is therefore desirable in order to avoid confusion. There is, however, some danger, lest, by emphasising one symptom, it should narrow our view of the disease and lead to the overlooking of cases in which lethargy is slight in amount or even entirely absent. On the whole, the name epidemic encephalitis seems the better, and will probably be generally adopted. In these lectures the two will be used indiscriminately.

The story of its early appearances in various parts of Europe has been frequently told, but the fact that an outbreak, of considerable extent, occurred in France, coincident with that recorded in Austria by von Economo in 1917, was for some time rather strangely overlooked. Cruchet, Moutier, and Calmette,[2] a week or two prior to the publication by von Economo of his classic paper in Vienna, recorded a series of 40 cases of "encephalo-myelitis" at the Société Médicale des Hôpitaux de Paris. That these were cases of epidemic encephalitis is now generally recognised, but when the second outbreak occurred in France in 1918, its relation to these cases in the preceding year was for some time overlooked. As Flexner suggests, the disease travelled more quickly than the literature concerning it.

HISTORICAL.

The accounts of past epidemics contain many references to outbreaks presenting clinical features which may easily be interpreted as instances of this disease. Crookshank[3] has collected most of the available information on this subject in his many valuable papers. Of the three epidemics which have been more closely associated with epidemic encephalitis, two have been thus associated by their "lethargic" characters—the "Schlafsucht," of Tübingen (1712–13) and the disease called "nona" (1889–90); whilst in the third, Dubini's electric chorea (1846), the connexion is not through this symptom, but from the muscular jerkings. This latter disease did not suggest itself as a precursor of epidemic encephalitis until after 1919, when the myoclonic type first became prominent. If these three diseases really were outbreaks of epidemic encephalitis, they failed to show the variety or the extent of spread which the present "influence" has done. Isolated examples of more or less definite cases have been found in the literature of the past century. Gayet,[4] Bozzolo,[5] Achard and Paisseau,[6] Raymond and Claude,[7] and others have published such cases.

In 1903 an apparently typical case was under my care in a boy of 11. Within two days of onset with fever, malaise, and vomiting, he had attacks of irregular breathing with dyspnœa leading to tetany. Dysphagia was also present. Right facial palsy and aphasia with jerkings in the limbs occurred next day. He was very drowsy by day and restless and irritable at night. There were incoördinate movements of the eyes and oscillations of the eyeballs "not amounting to nystagmus." Marked sweating and (?) loss of accommodation. Kernig + at one time. Recovery took place in two or three weeks, but a slight febrile recurrence occurred about six months later, and a permanent slight facial paralysis with spasmodic twitching persisted for many years. He is, however, a healthy man and saw active service in the war. In the same year, 1903, a woman attended hospital, complaining of constant sleepiness. She would fall asleep at all hours of the day whilst working or eating. This patient was lost sight of and cannot be traced.

J. A. Nixon, of Bristol,[7a] has recorded a typical case in a boy, which occurred in 1908. Apart from the suggestive clinical picture, during the acute stage, the resulting Parkinsonism makes its true nature evident. Souques [8] dates a case of paralysis agitans from a probable encephalitis in 1910. The patient was then 39 and for more than a year slept all day and had to be wakened to eat. During all this time there were rigidity and awkwardness in the left arm. The tremor did not begin until 1914.

In this connexion it is of some interest that during 1916, whilst Cruchet's cases were occurring in France, it is probable that isolated cases were occurring on the British front. In June of 1916 a soldier was invalided home, and came under my care at the Third Northern General Hospital suffering from what was then put down as an "atypical paralysis agitans." He was only 38; the face and posture, though slight in degree, were unmistakable. There was usually a fine tremor of the right arm and leg, but at times there was a coarse intention tremor. The pupils were unequal. At that time the question of a post-encephalitic residuum was necessarily not thought of. It seemed worth while to follow this case up and see what had happened. He is now in a hospital, and by the courtesy of the medical officer in charge, the following facts have been ascertained. At the present time, seven years after onset, he has "a coarse tremor of the right hand and arm, increased by voluntary effort. Some rigidity. No anæsthesia or wasting. Headache, vertigo, and broken sleep at times, and he is very excitable." It is thus evident that during these seven years he has not developed as a typical pre-senile paralysis agitans does, and the persistence and irregularity of the residua resemble cases of encephalitic origin.

In 1912 G. W. Watson, of Leeds,[9] recorded two cases of focal encephalitis which have many resemblances to epidemic encephalitis. Small outbreaks in children, of a suggestive kind, were published by Comby [10] in 1907 and Gordon [11] in 1913.

EPIDEMIOLOGY.

In tracing the spread of the disease to various parts of the world, it is evident that whilst its occurrence was recognised in certain places only, isolated cases of a similar kind were probably present over a much wider extent in Europe than the records of that time admitted. Frequently they were referred to as "Grippe-encephalitis," but with the advent of more definite outbreaks in later years their true character has been admitted. The most severe outbreak in Europe generally was that of the winter 1919–20, whilst in this country by far the largest outbreak was in the following winter 1920–21.

In January, 1919, the Local Government Board made notification compulsory. As a result we have in this country statistics which are unequalled either in quality or quantity by any elsewhere. The value of the reports issued first by the Local Government Board and later by the Ministry of Health, in regard to this disease, cannot be assessed too highly. They

are models of what a Government department can do to forward medical knowledge.

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1919	541	1921	1470
1920	890	1922	454

It is clear that the number of cases in many other European countries has been very much larger than in this country. In France it is estimated that there must have been at least 10,000 cases up to 1920, and in Italy up to April, 1920, 3900 cases had been reported.

INCIDENCE OF THE DISEASE.

Seasonal Incidence.—In most countries this has been strikingly constant. The outbreaks usually begin in November or December and reach their maximum in February or March, disappearing rapidly in April and May. This seasonal incidence was first called attention to by S. P. James [12] in 1918, and by him emphasised as a point of difference from poliomyelitis. In one or two places outbreaks have shown their maximum at other periods, but this is exceptional.

Occupation and Sex.—There is nothing noteworthy as to the incidence in different occupations or the two sexes. Statistics of large numbers show that the sexes are about equally affected (Parsons [13]).

Age.—The first series of cases published in this country in THE LANCET in April, 1918, included a woman of 70 and Harris's [14] case of a new-born infant. Between these extremes the ages varied widely. This has been characteristic throughout. No age is exempt. The difference in age-incidence between this disease and poliomyelitis was also emphasised by James [12] in 1918 and his observation has been fully confirmed by subsequent events. Batten and Still [15] first called attention, in this country, to the peculiar form in young children, in their paper on "Epidemic Stupor."

Race.—In Warsaw, Sterling [17] found the case-incidence in the Jewish population much greater than amongst the Christians.

Case-mortality.—The case-mortality is high. The figures vary in different countries. In England and Wales the official figures are: 1918, 22 per cent.; 1919–20, 48·3 per cent. In most other countries the figures come from the records of individual observers only, and these vary widely. On the whole, the average appears to be something over 25 per cent. This figure is much smaller than that of the case-mortality in this country. The difference is possibly due to the varying inclusion, or exclusion, of mild cases (*formes frustes*). In official statistics many of these are probably absent, as they are not notified, whilst individual observers, on the look-out for such cases, miss none. There seems no evidence, except the official figures, to suggest that the disease has been more severe in this country than elsewhere; indeed, judging from the literature, the reverse seems more probable. The mortality, according to Parsons,[13] is high in the first five years of life—lowest at about 10 to 15—then rises with each decade, until in the seventh it is 80 per cent.

Pregnancy.—Judging from the number of recorded cases it appears as though pregnant women were particularly susceptible to this infection. Whether this is really so or not, is difficult to prove. There is some evidence that in women who have suffered from an attack, the occurrence of a subsequent pregnancy seems to precipitate the onset of later manifestations. It may occur at any period of pregnancy, but usually towards the end, rather than early. There seems to be no particular tendency to abortion. The mortality is thought by many to be higher than in other cases. The official statistics of this country do not confirm this. The question of whether or not to empty the uterus, either by induction of labour or Cæsarean section, is very difficult to answer. The evidence on this point is, as yet, contradictory. Personally, I have seen induced labour followed by death, and Cæsarean section, even under most adverse conditions of persistent hiccough, completely successful—a healthy child was born and the mother recovered. The effect on the child will be dealt with under contagion.

CONTAGION.

The rarity of any evidence of contagion has been noted in every country and in every outbreak which has occurred. There is, however, evidence from three sources that contagion may occur, at times to a marked degree. These sources are: (*a*) Outbreaks occurring in institutions; (*b*) mothers infecting new-born babies; (*c*) more than one case in household, nurses attending cases, &c.

(*a*) Of the first group three striking examples have occurred. The first was in August, 1919, at a girls' home at Derby, investigated by MacNalty and fully recorded in the annual report of the Ministry of Health, 1919–20. Twelve cases occurred amongst the inmates within two weeks, with five deaths. The true nature of the disease was proved by pathological and experimental investigations with material from a fatal case, carried out by McIntosh and Turnbull.[18 19]

The second outbreak was reported by Krause [20] in July, 1922. The date of its occurrence is not stated. This, also, took place in an institution for girls, in the Lower Rhine district. Ten who slept in the same room were taken ill with dysphagia, dyspnœa, diplopia, and paralysis of accommodation. Nine died within two and a half days. Thirteen other inmates became ill some days later, four of whom died. The doctor attending them was similarly affected eight days later. The pathological investigations had not been completed at the time of publication, but no other obvious cause was found post mortem. Food poisoning, which had been suspected, was positively excluded.

The third was recorded by Fyfe.[21] It occurred in September and October, 1922, at a village school for girls in Warwickshire. Four scholars were affected—there were no deaths. The attacks were of lethargic type and ambulatory. In three cases there were definite mental residua.

Two striking features of these three epidemic outbursts of intense contagion are, that all occurred in institutions for young females, and, that in two, certainly, they appeared at periods when no general outbreak of the disease was occurring in the neighbourhood. The exact date of the Rhenish outbreak is not given. It was reported to the Cologne Society in July.

(*b*) The number of cases in which children born of parents suffering from the disease have become infected is quite considerable. Harris,[14] Pirie,[13] Montgomery,[13] Legge,[13] Mercier Andrieux and Bonnaud,[22] Santi,[23] and others have recorded such cases. In a case seen by Novaes e Sousa[24] myoclonus was present in the baby during parturition. Experimentally also Levaditi, Harvier, and Nicolau[25] have succeeded in transmitting their virus, obtained from human encephalitis through a pregnant rabbit to the central nervous system of a fœtus rabbit in utero. In Hallé's [26] case the mother began with encephalitis whilst suckling a healthy four months' baby. She declined to wean it. The baby began to be ill nine days after the mother, and died in five days; the mother recovered.

(*c*) Of other isolated cases—Buzzard and Greenfield[27] saw mother and son affected within 17 days, De Laroche[28] wife and husband within a month, Reece[29] and Lortat-Jacob[30] nurse and encephalitis patient, Roger and Blanchard[31] two soldiers in neighbouring beds, Netter[32] three children sleeping in same room. The fact that such cases are thought worth recording is the strongest testimony to the general absence of contagion.

Kling, David, and Liljenquist[33] in an intensive study of an epidemic in the Swedish province of Wilhelmina found a large number of incomplete cases in the households where the full form of encephalitis cases occurred. Some of these had

evidences of nervous complications, others had merely slight generalised malaise. In two houses all the inmates were infected with one or other form of the disease.

DURATION OF INFECTION.—INCUBATION PERIOD.

There is some evidence, both clinical and experimental, that contagion may persist for a very long time. Netter,[34] Lemierre,[35] and others have recorded such cases. As a rule, the contagion seems to light up with a recrudescence of the disease, which may be after an interval of many months. Experimentally Levaditi, Harvier and Nicolau,[25] and others find that their virus can be preserved active for many months, whilst Netter, Cesari, and Durand [36] obtained a positive result in a rabbit from the nervous system of a case fatal after 15 months, and Kling [37] from the cerebro-spinal fluid of a post-encephalitic Parkinsonian of 18 months' duration. The clinical occurrence of "recrudescences" is a well-recognised characteristic of the disease. The long duration of infection adds considerably to the difficulty of any kind of preventive isolation.

From such data as are available Parsons [13] concludes that the incubation period may be from one day up to two weeks or even more. Kling and Liljenquist[33] from three of their cases think that ten days is the average period, and in Hallé's case [26] this was so.

EPIDEMIC HICCOUGH.

Although the occurrence of hiccough in epidemic encephalitis was noted by von Economo [1] in 1917, and by Lord [38] at Colwyn Bay in 1918, the actual epidemic of febrile hiccough did not begin until the late autumn of 1919—almost coincidently with the first appearance of the myoclonic type of encephalitis. Cases were reported from various parts of Europe and also from Winnipeg (Boyd [39]), where at least 50 cases were seen preceding an outbreak of encephalitis. During the winter of 1920–21, these hiccough epidemics recurred to a considerable extent in various parts of Europe, France, Italy, and Switzerland particularly. In this country they were also seen, but only in comparatively few numbers and scattered areas. The hiccough is usually rather severe, lasts for a few days, and is often accompanied by slight feelings of malaise, headache, feverishness, and perhaps catarrhal symptoms. It may be more severe and even distressing, persisting for a week or two. It is usually intractable.

Infectivity.—There is abundant evidence that it is contagious. In all countries where it has appeared, cases, in which contact with a case has led to infection, have been repeatedly recorded. In this country Farrar [13] traced direct contact in a series of eight cases. Doctors attending cases have themselves suffered. Nor has it entirely disappeared. During February, 1923, I saw three cases in one household, one of which persisted violently for a fortnight. Other cases have also been reported during the last few weeks in the Midlands.

Relationship to Encephalitis Lethargica.—Lemoine [40] in France, and Farrar [13] in this country have recorded cases in which contact with a case of epidemic hiccough has been followed by a typical attack of encephalitis lethargica. Dargein and Plazy [41] saw a man who, beginning with what appeared to be a simple case of epidemic hiccough, which lasted for 18 days, recovered, but about two weeks later developed a typical oculo-lethargic type of encephalitis. Dufour,[42] Clerc Foix and Mercier des Rochettes,[43] and others have reported similar cases. Some are of opinion that the two conditions are identical. Bing and Staehelin [44] include "singultus epidemics" in their statistics of encephalitis, as one of the rudimentary forms: Lhermitte [45] speaks of *Le Hoquet épidémique: forme singultueuse d'Encephalite épidémique.* This, however, seems at present a matter of uncertainty and there are difficulties in accepting such a generalisation. Rosenow and Jackson,[46 47] from their experimental work on epidemic hiccough, believe that it is due to a non-filtrable coccus of the pneumococcus-streptococcus group. If this work is confirmed, it is difficult to correlate with the filtrable virus of epidemic encephalitis described by Loewe, Hirschfeld, and Strauss,[48] Levaditi, Harvier and Nicolau,[25] and others. At the present time no dogmatic statement on the relationship of the two conditions seems warranted.

RELATION OF EPIDEMIC ENCEPHALITIS TO OTHER EPIDEMIC DISEASES.

The controversies which in the early days raged around its relations to poliomyelitis have now subsided. They were at that time very natural. Many whose experience of the latter disease was very wide and whose opinions were weighty, inclined to the identity of the two. It is mainly, however, in the varying after-results that the two differ so widely, and on its first appearance such after-results were necessarily unknown. The residua of poliomyelitis are practically limited to greater or less permanence of the original paralyses; in epidemic encephalitis such paralyses form a relatively, and unexpectedly, small percentage of the many and severe residua.

The relation to epidemic influenza or "grippe" was not seriously considered in this country, or in Vienna, or France, on the first appearance of encephalitis, because there was then no concurrent epidemic of influenza, and because the symptoms of epidemic encephalitis and its mode of spread were so entirely different from those familiar in epidemics of that disease. In various countries, however, the identity of the two was for some time upheld with much tenacity. This view seems to be gradually weakening even in the most powerful of its strongholds. As time goes on the difference between the two diseases becomes increasingly marked.

Although the evidence appears sufficient to warrant considering epidemic encephalitis as a separate disease, its possible relationship to other epidemic diseases cannot be ignored. That it did appear at or about the same time as an epidemic of influenza of great severity and extent might be merely a coincidence, but seeing that outbreaks, the descriptions of which are so similar in many respects to those recently seen, have, in past times, been recorded in more or less close connexion with waves of epidemic influenza, the probability of some relationship is considerable. What is the nature of that relation has not yet been satisfactorily explained.

There are those who from an epidemiological standpoint would group together influenza, cerebro-spinal fever, polio-encephalitis, poliomyelitis, and epidemic encephalitis as arising from some common condition. According to this point of view, it would seem that could the waves of pandemic influenza be abolished, it is possible that the epidemics of the other above-mentioned diseases would disappear also; that whilst these "satellite influences" are not identical in form with influenza they are so nearly related to it that without its help they would not be potent factors in producing disease. There is much to be said from this point of view, and it may be that in generations to come, when further experience has accumulated, the exact relations in which these diseases stand to each other may be more intimate than is now generally believed. Possibly there may be some common factor in the constitution of the hosts or some associated change in physical conditions which renders many usually harmless parasites capable of becoming dangerous and destructive enemies to man at certain periods of time. Meanwhile, the more accurate knowledge of the individual components of these epidemic scourges would seem to be essential in approaching the ideal of preventing their occurrence.

The relation of epidemic encephalitis to the Australian X disease which appeared in that country in 1917–18, seems doubtful. Cleland and Campbell [49] consider that the two are widely separated both on clinical and experimental grounds. Breinl [50] and Flexner [51] incline to the view that it was an aberrant form of poliomyelitis.

PATHOLOGICAL ANATOMY.

The earliest findings by von Economo and von Wiesner [1] in Austria, in May, 1917, were soon followed by those of Marie and Tretiakoff [52] in Paris, in May, 1918, and of Marinesco [12] in this country, in October of the same year. Since then their findings have been repeatedly confirmed by pathologists in every country where fatal cases have occurred. There is indeed a definite recognised histopathology of the fully developed disease. Buzzard and Greenfield [27] called attention to the occurrence of "meningeal hæmorrhages." Bramwell and Miller [53] found a surface hæmorrhage over the cerebellum. The general histologic picture has been frequently described and is familiar. The perivascular cuffs of variable thickness and extent, the changes in the nerve cells and glial proliferation, the tendency to localisation in the grey rather than the white matter, and chiefly, but not exclusively, in the mesencephalon and basal ganglia. Kinnier Wilson [54] speaks of the "peri-aqueductal grouping." Other parts may, however, be affected—the cortex, the cord, nerve trunks, and ganglia.

MINUTE GRANULAR BODIES.

Da Fano and Ingleby [55] in 1919 described minute granules in the protoplasm of certain groups of nerve cells from fatal encephalitis cases. Da Fano, [56] in further investigations, found them both within and without the nerve cells, and also in salivary glands. Hume, Nattrass, and Shaw [57] saw them in four fatal cases. More recently Da Fano, [58] working with the virus of herpes febrilis, has found similar bodies in the brains of rabbits infected with this virus. Encephalitic neuro-corpuscles have also been described by Levaditi, Harvier, and Nicolau [25] in experiments with their virus of encephalitis. Da Fano believes that these are identical, morphologically, with the structures he finds in herpetic meningo-encephalitis.

LECTURE II.

CLINICAL SIGNS AND SYMPTOMS.

Epidemic encephalitis is characterised by three striking clinical features: (*a*) its polymorphism, (*b*) its irregular progress, (*c*) its many and peculiar after-results. The irregularity of its progress, by fits and starts (von Economo's *schubweise*), makes the separation of sequelæ from recrudescences almost impossible.

Onset.—Classification.

The onset may be sudden or gradual. Sometimes the suddenness is extreme. Apoplexy (Boyd [59]), epilepsy (Guillain [58]), syncope (Schmidt [59]), vertigo, headache, or other pains may, any one of them, appear "like a bolt from the blue." Such stroke-like onsets are not the most common. As a rule, however, the day of onset, sometimes even the hour, can be definitely stated. One of my patients went to bed perfectly well; on waking next morning he saw double, fell over on trying to get up, and talked incoherently. A little boy was playing in the snow in the afternoon and by tea-time was lethargic and feverish.

The onset may take various forms—general malaise with headache and fever, simulating epidemic influenza, slight delirium at night. Vomiting, and occasionally diarrhœa, sometimes of considerable obstinacy. Hume, Nattrass, and Shaw [57] saw acute diarrhœa at onset in a fatal case. Constipation, however, is more common. Drowsiness of varying depth, and usually increasing, may be the first symptom. Such cases may remain ambulatory for long periods or even throughout. Diplopia, with or without lethargy, is common. Other cranial or limb palsies may occur at onset. General extreme asthenia, acute mental symptoms, mania, delusional insanity, confusional states, a delirium tremens-like condition, or excito-motor phenomena of all kinds may be the first evidence of disease. Edwin Bramwell [53] called attention to the onset with severe neuralgic pains in the head or limbs. When the pain is abdominal the simulation to an acute abdomen may be very close.

No completely satisfactory method of classification has yet been made. The plan suggested by MacNalty, [12] and adopted, with the additions suggested by Walshe, [60] by the Ministry of Health has the advantage of simplicity and convenience.

GENERAL SYMPTOMS.

Fever is usually present, but, as a rule, does not play a prominent part in the disease. Hyperthermia is occasionally seen, even as high as 111° F. in a case reported by Gelpke, [61] which recovered. In one of my cases the temperature reached 107·5° at death. Headache is a frequent symptom and often persistent. Usually there is nothing characteristic about it. Lethargy in some degree and at some period or other is the rule. Graham Forbes [62] found it in 126 out of 130 cases. It varies in character and degree. It may be light and the patient knows what is going on around, but cannot rouse himself. In many, apparently asleep, one is surprised by the quickness of the reply to a question. In others the reply is unduly delayed. The sleep, however, may be much deeper than this and waking not easy. In such patients the period of lethargy may be a complete blank in their minds afterwards. The desire to sleep may be irresistible and occur at any moment.

Duration of Lethargy.

Lethargy may last for days, weeks, or, in rare cases, months. It may disappear and recur at long intervals. In one of my cases, a girl of 15, attacks of lethargy recur about once a month. Each lasts for a few days only. This has continued for five years. Netter has described a case in which lethargy appeared first 12 months after the onset of encephalitis. It may be absent throughout, even when ocular palsies are present.

Theories as to Cause of Lethargy.

Five possible views as to the cause of lethargy have been brought forward.

1. Buzzard [63] thinks that it may be due to increased intra-ventricular pressure, caused by the acute changes around the aqueduct of Sylvius.
2. MacNalty [12] suggests an extension of inflammation from the region of the third nerve nuclei to neighbouring afferent paths, thus interfering with stimuli to the thalamus.
3. Disordered hypophyseal function, leading to hypopituitarism, has been suggested on the grounds that lethargy is a symptom of this defect and that polyuria, obesity, and even Fröhlich's syndrome have followed encephalitis.
4. Marinesco [64] considers the lethargy as a part of the marked tonus changes which are so often present.
5. Abrahamson [65] looks upon a poisoning by the virus of the psychic synapses as causing the various stages of sleep in a gradual series from drowsiness at the one end to coma at the other.

As regards the question of hypopituitarism, no definite or sufficient pathological changes in the hypophysis have as yet been found in these cases to support this view. At present the data are insufficient for arriving at a conclusion as to the cause of lethargy.

Hyposomnia.

Hypo- or in-somnia may persist throughout. Laporte and Rouzaud [66] record such a case which was fatal on the eleventh day. More frequently it alternates with lethargy, either preceding or following it. Nocturnal insomnia will be referred to later. All agree that when present it is very intractable.

LOCALISING SYMPTOMS.

These are so numerous, seeing that any part of the nervous system may be involved, that it is only possible to refer to certain outstanding features.

The ocular disorders are almost entirely limited to the muscular actions. Changes in the optic nerves, though recorded, are rare. As a rule these muscular changes are, as Lhermitte pointed out, rather a disturbance of muscular synergy than definite strabismus,

although the latter may occur. Nystagmiform movements, or even irregular jerks of the eye muscles, are frequent. Paresis of conjugate movements is often seen. Incomplete bilateral ptosis, somewhat like an exaggeration of the "lids heavy with sleep," is often associated with lethargy and may persist. Pupillary disorders of every kind and in almost every combination have been observed. Argyll Robertson pupils with loss of knee-jerks was first recorded by Naef [67] at Munich in 1919. Jewesbury [68] recently showed such a case at the Royal Society of Medicine. Bilateral paralysis of accommodation is not uncommon. Genet [69] thinks that this, with intact light and convergence, is a valuable sign, and that it differs from other forms in its sudden onset and curability. The fifth and seventh nerves are both frequently involved. It is not unusual to find a facial diplegia. In one of my earliest cases this was the only symptom throughout. It disappeared completely. Weakness of the masticatory muscles is common; in some cases there is complete "diplegia masticatoria" for a time. The hypoglossal is often affected. Hemiatrophy of the tongue may persist as the only evidence of past disease.

Positive symptoms in connexion with all these cranial, as well as other nerves, are common. More commonly they occur as later manifestations, and will be dealt with elsewhere. In the tongue region they may be exceedingly troublesome. André-Thomas and Jumentiet,[70] Christin,[71] and Byschowski [72] have recorded such cases. In Schmidt's [73] case the tongue was rigidly projected over the teeth, necessitating surgical measures to give relief. Another feature of the cranial palsies is their temporary character and the tendency to shift from one nerve to another or from one side to another.

Dysphagia.

This occurs frequently. Many spasmodic affections of the pharyngeo-laryngeal region are also seen. In a certain number of these the similarity to rabies is very close. In October, 1918, I saw a case of this kind. The attacks of laryngeal spasm were frequent and of great intensity, the patient becoming cyanosed and unconscious in them. Tracheotomy was performed and gave relief. Any attempt at swallowing set up the spasm at once. The attacks passed off in a few days but were followed by other nervous symptoms. Similar cases were recorded by Denyer and Morley [74] in 1920, and by Kahn Barbier and Bertrand,[75] and Sarkies [76] in 1921. In a fatal case typical changes were found in the medulla and cervical cord. These cases call to mind those recorded in past epidemics, quoted by Crookshank [3] as "hydrophobia-without-the-dog."

Positive Excito-motor Phenomena.

Although positive excito-motor phenomena were present in isolated cases during the first outbreak, they then held no prominent place in the clinical picture. Amongst von Economo's first series, choreatic unrest and choreatic jerkings occurred in two cases, and Cruchet [2] also noted their occurrence. In January, 1919, Poynton [103] showed a myoclonic case in a child of 2, which began in the 1918 outbreak. It was not, however, until the epidemic of 1919–20 that they became predominant. Sicard and Kudelski [103] in Paris, and later Boveri,[104] called attention to the prevalence of so-called myoclonic types of the disease, whilst in this country Ellis [105] and others recorded similar cases. Since then large numbers have been seen in all parts of the world. In their more severe forms they present a very strange picture. The only case of this extreme type amongst my series occurred in December, 1919. Headache and pains in the neck occurred for the first week or two, then jerkings of extreme violence affecting chiefly the neck and shoulder muscles, causing extreme pain, associated with persistent insomnia and ending fatally. Lethargy was absent throughout. No autopsy was allowed. In this case, as in others recorded, the explosive speech was a notable feature.

Chorea-like movements have been frequently seen in later outbreaks. Stertz[106A] reports that 50 per cent. of his cases in Munich during the 1920 epidemic were of this type. In most cases the terms choreatic or choreatiform movements are used signifying that whilst like cases of Sydenham's chorea, they are not, as a rule, quite the same. That has been certainly so in most of the cases I have seen. The simulation of chorea may, however, be extremely close. In June, 1918, a boy of 16 was admitted to hospital with what was apparently chorea gravis. He was occasionally noisy and delirious at night; there was no heart lesion. Temperature normal; respirations 24 to 36. He became steadily worse and died three weeks after admission. The history showed that he had begun to feel ill about a month before, lethargy being marked for several days. Twitching and delirium kept recurring at intervals a fortnight after onset. Looking at the movements alone in this case they were indistinguishable from those of Sydenham's chorea. From the history it was obviously encephalitis lethargica.

Paralysis of all kinds may occur, hemiplegias, monoplegias, paraplegias, crossed hemiplegias. Buzzard and Greenfield [27] were the first to call attention to hemiplegia in all its forms as being of this origin. Permanent flaccid palsies may result, but compared to their frequency after poliomyelitis they are relatively rare in this disease. Polyneuritis affecting chiefly the legs is not very common. The three cases which I have seen all recovered, two completely.

Myasthenic Type and Cerebellar Type.

Cases simulating myasthenia gravis have been recorded. The first case of encephalitis which came under my notice in 1918 was of this type. Grossmann [77] has recently recorded three such cases.

Fragnito [78] and others have recorded cases showing definite cerebellar symptoms, and Marinesco [12] in 1918 found anatomical changes in the cerebellum of a fatal case.

The Reflexes.—Fits.

The changes in the reflexes necessarily vary with the location of the morbid process in the central nervous system. The cases with loss of knee-jerks and fixed pupils have been referred to above. Kernig's sign may be present in the acute stages of meningitic type.

Fits of epileptic type are not uncommon. They may occur at onset, during the illness, or as an after result. In one of my cases a little boy whilst convalescent in the third week suddenly had a series of fits with rise of temperature, which lasted only a few hours. He then continued his interrupted recovery. Edgeworth,[79] of Bristol, has recorded a similar case.

Hypertonus.—Katatonus.

Both of these are common symptoms. In a case reported by Davis,[80] in which the arms were firmly flexed, they were extended under anæsthesia and fixed in extension. On removing the splints the arms were equally fixed in extension and could not be straightened. Petren [81] speaks of a case in which the hypertonus was so great as to simulate paralysis.

Trophic.—Parotitis.

Bedsores are not uncommon, particularly in cases associated with incontinence. Severe acute wasting has been recorded by MacNalty and others. It is not rare in some Parkinsonians.

A certain number of cases have been recorded in which bilateral parotitis was an early symptom. Grenet [82] recorded the first case of this type in 1918. In 1919 such a case came under my notice. Mumps was suspected at first, but later typical symptoms of epidemic encephalitis appeared and the true nature of the disease was confirmed pathologically. Early sialorrhœa is seen occasionally.

Skin.—Polyuria.

Unfortunately no diagnostic rash occurs in this disease. Erythematous and at times purpuric eruptions occur, but there is nothing constant or characteristic about them. The occurrence of "greasy face" (Salbestricken) was noted by Cohn,[83] v. Sarbo,[84] Stern,[85] and others. Herpes febrilis seu labialis is not common. Herpes zoster has been observed.

Polyuria has occurred in a considerable number of cases. It usually begins from the third to the seventh week, somewhat suddenly. It often ends suddenly also. In Benard's [86] case as much as 19 litres was passed per day.

Hæmorrhagic Syndrome.

From time to time a hæmorrhagic tendency has been noted. Buzzard and Greenfield [87] called attention to meningeal hæmorrhage, and hæmorrhagic cerebro-spinal fluid has been several times observed since. Naish recently had such a case under his care at the Sheffield Royal Hospital. Purpuric eruptions have also been reported by Roger [87] and Rathery and Bonnaud.[88] Netter described a case of intestinal hæmorrhage; Bassoe [90] and Eschbach [89] saw severe epistaxis, and Petit [91] recorded *sueurs de sang*, occurring in paroxysms on the face. Quite recently Tinel and Dupouy [92] have reported two fulminating cases, one with fatal hæmatemesis, another with terminal nasal, buccal, and intestinal hæmorrhages. In each there were multiple ecchymoses. Since then Douzelot and Krebs [93] saw a similar fatal case with severe gastro-intestinal bleeding, hæmothorax, and an extensive purpuric rash.

EXPERIMENTAL WORK.

In 1919 Strauss, Hirschfeld, and Loewe,[94] in New York, succeeded in obtaining positive results in the monkey and rabbit from intracerebral inoculation of central nervous system emulsion from a fatal case of encephalitis and also from naso-pharyngeal washings from a non-fatal human case. There was some tendency to hæmorrhagic lesions. Later, in 1919, McIntosh and Turnbull,[19] in this country, obtained positive results in the monkey from brain emulsion of a fatal case in the Derby outbreak. These results were obtained by intracerebral and intraperitoneal routes. In 1920 Loewe and Strauss [96] described, in connexion with their virus, a filtrable organism obtained from the brain, naso-pharynx, spinal fluid, and blood of a human case. They also found that their virus could be preserved in 50 per cent. glycerine, and passed through many series of animals.

In 1920 Levaditi, Harvier, and Nicolau,[25] at the Pasteur Institute, began the publication of their successful experiments on the virus of encephalitis. This work, which has been continued up to the present time, has, incidentally, given rise to so much other work in various fields of research, and led to such suggestive results, that it necessitates careful consideration. Their first successful results were obtained, as were those of Loewe and Strauss, and McIntosh and Turnbull, from brain emulsion from a fatal human case. This strain is spoken of as "virus C." Besides this, they obtained positive results from a human naso-pharyngeal swab, which they call "virus fixe." So far as they can ascertain, these two viruses are identical. Both give positive results in rabbits, either when inoculated directly into the cerebrum, or when applied to the previously abraded cornea in the rabbit. The latter is spoken of as the corneal route. These have been carried on in series for many months.

The incubation period by the intracerebral route is 4 to 6 days, by the corneal route 8 to 12 days. Enucleation of the infected eye after 24 hours does not prevent the onset of encephalitis. The incubation period can be reduced by the administration of narcotics. The changes are always found in a particular area of the brain, which they call the elective zone, and is not the same as that affected in rabies. There are two stages in the process, one acute, polymorphocytic, and of short duration, the other more chronic, and mononuclear.

Individual rabbits vary considerably in susceptibility to the virus. McIntosh [97] has recently confirmed the diagnostic value of rabbit inoculations in cases of epidemic encephalitis. He finds that basal nuclei emulsion is usually positive, whilst cerebro-spinal fluid gives positive results in about 25 per cent. of the cases. He lays stress on the site affected, the nature of the cells, and the foci in the brain.

Properties of Virus.—Human Salivary Virus.

Levaditi and his fellow-workers find that their virus has a selective affinity for nerve cells, can be preserved in glycerine solution or in a dry state for very long periods, and remains active in milk at ordinary temperature for at least 96 days. It is effective in 1/1000 saline, but innocuous in 1/10,000. Of various antiseptics, potassium permanganate 1/1000 destroys its activity completely in vitro. They did not obtain any positive results from the blood, salivary glands, or spinal ganglia, thus differing from the results in rabies and poliomyelitis respectively.

In further investigations it was found that the saliva from healthy human mouths is also capable of producing positive results, closely similar to those obtained with encephalitis virus, when applied to the rabbit's cornea. In this case, however, no encephalitic changes follow. The virus is keratogenous only. It is filtrable and so far as can be ascertained not due to a recognisable organism. It is only found in the mixed saliva of the mouth and not in the parotid secretion as it issues from the gland. It appears to be in some sort of connexion with the mouth epithelium. These findings are confirmed by Doerr and Schnabel,[95] and others.

Virus of Human Carrier.

On May 7th, 1921, Levaditi, Harvier, and Nicolau [25] obtained from the mouth of a healthy man who had been in contact with cases of encephalitis, a virus which differed from the above salivary virus in that it produced encephalitis as well as keratitis. Indeed, it behaved in every way, biologically and in its effects, like their original virus C and virus fixe; they therefore believe that the existence of carriers, as in poliomyelitis, is experimentally demonstrated.

At this stage of their work there were thus four available viruses: (1) virus C; (2) virus fixe from cases of human encephalitis; (3) salivary virus from human mouth, keratogenous only; and (4) salivary virus of carrier, keratogenous and encephalitogenous, like (1) and (2).

Virus of Herpes Febrilis.

Meanwhile other workers, Blanc and Caminopetros,[98] recalling the work of Grüter in 1913 on the virus of herpes febrilis and its similarity to the results obtained by Levaditi and his fellow-workers, began to study the properties of this herpetic virus. Grüter [99] had successfully transferred human corneal herpes to the rabbit's cornea, and these experiments had been confirmed by others. Levaditi, Harvier, and Nicolau [25] also find that this herpetic virus has close relations with the virus of encephalitis and the salivary viruses, so that it is possible to place the five in a regular series. Perdrau [13] in this country, working with herpetic virus, confirms the transmission in series, the absence of bacteria and the preservation in glycerine solution, and Da Fano,[56] working with the same virus, confirms many points of similarity with the virus of encephalitis.

According to Levaditi, Harvier, and Nicolau, encephalitis lethargica is due to a filtrable specific agent—the ultra-virus of encephalitis. This virus may exist in at least three forms: (*a*) In the mixed saliva of healthy persons. It is attenuated, has an affinity solely epitheliotrope and its power is solely keratogenous. (*b*) In the vesicles of herpes febrilis (labialis). Here it is more virulent; compulsory epitheliotrope, but a facultative neurotrope. (*c*) In the saliva of carriers and in the naso-pharynx and central nervous system of encephalitics. This is very virulent, and an obligatory epitheliotrope and neurotrope.

LECTURE III.

PROGNOSIS.

Whilst in most acute diseases prognosis concerns chiefly the question of life or death during the attack, in the case of epidemic encephalitis it does not end there, but includes the almost equally important

question, Will the recovery be complete, or will something be left behind?

Prognosis as Regards Life.

The case mortality is high, probably something over 25 per cent. The most fatal period is the second week, about the eighth day. Of 135 fatal cases, collected from the literature, in which exact dates of onset and death are given, 15 per cent. died in the first week, 34 per cent. died in the second week, 15 per cent. died in the third week, 13 per cent. died in the fourth week, and 23 per cent. died later than the fourth week. The earliest fatal case was on the second day. Sudden death is by no means uncommon, especially when the medullary region is involved.

Prognosis in Various Types.

It is not possible to lay down any very definite rules for guidance. Just as it is difficult to classify this protean disease, so it is correspondingly difficult to prognose from early symptoms.

Mode of onset: Smith,[101] U.S.A., suggests that a sudden onset is more grave than a gradual one. In this connexion, so much depends on the interpretation of the word "sudden." It is certain that severity of onset is no sure guide to prognosis. Cases with severe onset recover, and cases of mild and insidious onset end fatally.

Lethargy is thought by some to be of serious prognosis. Pecori [102] finds a high mortality in his "soporose" cases. The term lethargy, however, is so wide, that without qualification it is of little value. Severe lethargy at onset is not necessarily of bad prognosis. On the other hand, lethargy which begins gradually and deepens day by day, is of serious import, especially if accompanied by rising temperature, profuse sweating, and incontinence, as was emphasised by Edwin Bramwell.[53] Gelma and Hanns [100] think the prognosis is better when sleep is light and waking easy.

Early stuporose lethargy in young children with meningitis-like symptoms is, in my experience, of serious import. The prognosis in cases of excito-motor type is very uncertain. When the "myoclonic" cases were first observed in 1919–20, by Sicard and Kudelski,[103] Boveri,[104] Ellis,[105] and others, the mortality amongst them was very high. Since that time similar cases of less severity have been common, and the gravity of this type as regards life is not so serious as was at first thought. Choreatiform types also may present any degree of severity. Severe delirium is a symptom of serious omen (Bassoe,[90] Pecori,[102] Bonhoeffer,[106] and others). Cramer [107] thinks that insomnic cases are graver than lethargic.

Parsons [13] from the official records finds that cases of generalised type without localisation (Type I.) are more fatal than other types. All are agreed that in few diseases is prognosis as regards life more uncertain and in none is it necessary to be more guarded.

Prognosis as Regards Complete Recovery.

Epidemic encephalitis has separated itself clearly from other infectious diseases by its numerous and peculiar later manifestations or residua. These are often so characteristic as to be retrognostic. "By their fruits ye shall know them" applies aptly to this disease. Many of these are so late in appearing that the percentage of them is an increasing one. They may be classified into (*a*) other residua, (*b*) Parkinsonism. The former may be considered under seven headings:—

(*a*) *Other Residua.*

1. *Mental Residua.*—These range from mere psychasthenic conditions to acute mania, sometimes of a most violent kind. In order to ascertain to what extent mental cases requiring certification had occurred as a result of this disease in England and Wales, I made inquiry from all the public asylums on this point. Thanks to the courtesy of those in charge, the following figures have been obtained.

Replies were received from 100 out of 111 asylums in England and Wales. In 80 of these no cases attributed to encephalitis lethargica had been admitted. In 20 asylums, 30 cases only had been admitted since 1918—when the disease was first recorded in this country. Of these 30 cases, the sexes were equally divided. Nine were under 20 years of age, 14 were over 30 years of age. In most of the cases (19) the attack of encephalitis occurred in 1920 or 1921. Six died, 12 recovered; in 9 there is no improvement; 7 of these are over 30 years of age. The types varied widely. The confusional and stuporose types appeared to run the most favourable course. It is gratifying to find that in this country, at any rate, the amount of mental disorder due to encephalitis and necessitating certification is not considerable.

2. *Moral Changes.*—If, however, the asylums do not see much of the ravages of this disease, the homes of the patients and even the police courts for juvenile offenders tell a different story. Whilst in adults "residua," in the form of "not the man he was before," "unable to concentrate," and so forth, are common, it is in the juvenile cases that moral changes are seen most markedly. The good child becomes a naughty child, the clever child a dunce! Restlessness, irritability, amounting to paroxysms of temper, greediness, aggressive behaviour, and morbid sexual tendencies are common results. In more severe forms thieving, suicide, and even homicidal tendencies have been recorded.

Cameron,[68] from the clinical point of view, and Shrubsall,[66] from that of the medical school officer, have made it clear that many of these cases are merely exaggerated examples of the "difficult child," and that firm and judicious handling brings about marked improvement. This is no doubt true, but it must not be forgotten that the particular child has only become "difficult" since its illness, that it has often been a very "easy" child previously, and that the domestic machinery cannot readily be adjusted to meet such a change of disposition, especially when it coincides with convalescence from an alarming illness.

Many of the cases are, however, altogether beyond parental control. Auden,[108] Paterson and Spence,[109] and others have recorded such cases, more than one of which has reached the police courts. It thus becomes a medico-legal problem of considerable importance. In one of my cases the boy who was previously a clever scholar is now so aggressive and difficult that it is impossible for him to retain any situation.

3. *Nocturnal Excitement in Children.*—This peculiar residuum is very widespread. Pfaundler [142] was the first to record a series of cases in Munich in 1920. Since then many cases have been seen in other parts. Happ and Blackfan [110] reported many in America; Morley Fletcher,[111] Findlay and Shiskin,[112] Paterson and Spence [109] in this country. It may begin early in the disease or only after a considerable period of time. Towards evening, sometimes with remarkable punctuality (Marie and Lévy [113]) a change comes over the child. It becomes restless, excitable, and unmanageable. At bedtime this becomes worse and there is no suggestion of sleepiness. Sometimes the child sings, whistles, or makes queer noises, gets out of bed and runs about, until the morning is well advanced. It then falls into a heavy sleep which may last until midday. On waking, as a rule, all the excitement has passed off, and the child may appear almost normal during the afternoon, only to go through the same trouble as evening approaches. The condition is quite intractable to ordinary therapeutic measures and may persist for many months. It is spoken of occasionally as an inversion of the sleep-rhythm. This description is somewhat misleading. It is not merely that the hour of sleep is altered, but there is a definite mental excitement recurring each evening; this continues through the night, until the nervous centres are exhausted and the

sleep which results is followed for a few hours by an almost normal condition until the recurrence of excitement. This residuum is frequently associated with others, such as one of the respiratory residua, as in Morley Fletcher's case.[111]

4. *Respiratory Residua.*—Respiratory disorders are concerned with the nervous mechanism of the act, not with the respiratory organs themselves. They may be present in the early stages also. Polypnœa has been frequently noted. In some cases this leads, as in physiological experiments on deep breathing, to tetany. Barker and Sprunt [114] recorded such cases, and it occurred in my case seen in 1903 (vide supra). Cameron [68] showed a tracing of this type which was obtained from a child with nocturnal excitement under his care. The periods of polypnœa were followed by prolonged apnœa in which the child became somewhat cyanosed. Marie, Binet, and Lévy[115] have classified these respiratory residua into (*a*) changes in rhythm, polypnœa, bradypnœa, apnœa, periodic breathing, (*b*) spasmodic cough; (*c*) respiratory tics and abnormal rhino-laryngological sensations. The spasmodic cough may be of great violence and persistence. It, also, may be worse at night, as in a case recently under my care, associated with great increase in weight.

5. *Residual palsies* may occur, but they are much fewer and less marked than was originally anticipated would be the case. Their comparative rarity is in striking contrast to the results of poliomyelitis.

6. *Excito-motor Residua.*—The variety which this form of residuum can take is remarkable. Some of them are frequently associated with the Parkinsonian syndrome, and indeed are by some included in that.

Mlle. Gabrielle Lévy [116] has recently published a monograph dealing with these phenomena very fully. They may take the form of choreatic, bradykinetic, myoclonic, or shaking movements. The term bradykinesia is used by Lévy in this connexion to indicate "large, slow, rhythmic global movements involving one or more limbs or the head and trunk." This definition has no relation to the use of the term by others to indicate the slowness of muscular action in Parkinsonians.

In most of these movements, which are involuntary and uncontrollable, rhythmicity is the characteristic. Sometimes the rhythm bears relation to the respiratory rate. Cruchet [117] speaks of myorhythmia. Other movements which have been described include curious oscillatory movements of the lips in a lateral direction something like the movements of a rabbit's mouth. Cockayne [68] recently showed an example of this at the Royal Society of Medicine.

Another phenomenon, repeatedly seen, is a temporary inability to raise the eyelids. This may last for a few moments. There is no sign of any spasm of the orbiculares oculorum. In one of my cases, a boy with some Parkinsonian residua and a distinct perversion of moral character, this temporary blinking occurred when cycling with disastrous results to the machine. Automatic actions of various kinds have been described. Spasmodic tics, especially about the facial and masticatory regions, are not uncommon.

7. *Trophic Residua.*—Many cases of marked obesity following encephalitis have been recorded. In Barkman's [118] case the man put on 42 kilos in weight in two years. This was accompanied by excessive sweating, loss of sexual power, and a feminine appearance. Bertolani's [119] patient, a young woman of 23, gained 17·5 kilos in 15 months. Stiefler [120] saw a girl of 13 who gained 21·3 kilos in four months. One of Livet's [121] patients, also a young woman, gained 13 kilos in 12 months. The interest of these trophic residua lies in their possible relation to hypophysis disorder, and the occurrence of polyuria, and also lethargy. In one of the post-encephalitic cases reported from the asylums a considerable growth of hair occurred on the back whilst she was an inmate, disappearing as the mental condition subsided.

(*b*) *Parkinsonism.*

This term, which originated in the French school, will be used here to signify those post-encephalitic residua which present features which are found in presenile paralysis agitans. As a matter of fact, many of these cases of Parkinsonism have as their chief signs the immobile facies, to which Parkinson, in his original essay in 1817, made no reference, and plastic rigidity, to which his allusion is very slight and incomplete. In spite of this, the term is convenient, and it is desirable, at present, to keep the post-encephalitic and the ordinary presenile forms distinct from each other for descriptive purposes until more is known of their relations to one another.

Before the present appearance of epidemic encephalitis cases of paralysis agitans below 40 years of age were very uncommon. Willige,[122] in 1911, was able to collect only about 20 such cases from the literature up to that date. Of these, the earliest age of onset was 18 to 20 years. At the present moment there are, probably, more than that number of complete cases, as a result of encephalitis, in children under 15, in this country. On the continent the numbers are probably even greater. Goldflam [123] speaks of "an epidemic of paralysis agitans" in Warsaw. It is estimated that 25 per cent. of the cases suffer from this residuum. It may occur in two forms, "early" and "late Parkinsonism."

Early Parkinsonism.—The "early" form may appear within a few days of the onset of symptoms. In one of my first series of cases,[124] a woman, aged 56, "the facial expression was so suggestive of 'Parkinson's mask' that I thought at first she must have paralysis agitans." This was within a week or two of onset of symptoms. Buzzard,[125] however, was the first to describe a complete picture of early Parkinsonism in a man who began with encephalitis ten days previously. Kinnier Wilson [126] also recorded a case beginning in the 1918 outbreak. In more recent outbreaks the number of these early cases has been very large.

"*Late*" *Parkinsonism.*—The "late" form may occur only after a long interval. Souques,[127] Girardi,[128] Rathery and Cambessédès [129] described cases in which the interval was 9 to 12 months. Guillain and Gardin,[130] Sicard,[135] and Souques,[136] 15 months; Parkes Weber,[131] Renaud,[132] and Bing,[133] 18 months; McAlpine,[68] 3¾ years. This interval may be free from symptoms of any kind (De Lisi [134]). In a few cases the evidence of this is striking. In Renaud's case[132] the man was on military duty for several months after recovery from encephalitis. In Guillain and Gardin's [130] case the patient during the interval served as mechanic on an American liner and whilst in America worked as cowboy, labourer, and post-office official. Meyer [137] records the case of a woman who had encephalitis, recovered, became pregnant a year later, and Parkinsonian at the sixth month of pregnancy. Lévy[116] reports a similar series of events two years after encephalitis. Parkes Weber [131] was the first to call attention to late Parkinsonism following an ambulatory attack. On the other hand the interval, even if long, may be not one of apparent recovery, but some one or more of the other residua are present, upon which Parkinsonism is grafted. Probably this is the more common course.

CLINICAL DIFFERENCES BETWEEN PARKINSONISM AND THE PRESENILE FORM OF PARALYSIS AGITANS.

These may be classified under three headings: (1) Parkinsonism is often something less than paralysis agitans; (2) it is often something more than paralysis agitans; (3) it differs in its mode of onset and its manner of progress.

1. The feature which is usually absent or minimal is the typical pill-rolling fine tremor. Although present in a few cases, it is exceptional. Even where the general affection involves the whole trunk and limbs, the tremor may not be present in this form.

Another most common feature is the limitation of parts affected. Amongst my cases at the present, one boy has an immobile facies and head, otherwise nothing, below the neck he is a normal active person; one woman has immobile facies and rigid right arm; another has immobile facies, rigid left arm; a man has complete rigidity of the face and all the limbs with extreme slowness of action; another man has immobile facies and festination, but his hands are hardly affected; he can take a watch to pieces, clean it, and put it together again. Whilst in paralysis agitans it is not unusual for one limb or one side to be affected at first, yet as a rule it extends fairly soon. In these cases as the years go on such extension does not seem to be occurring.

2. The frequency of other residua in association with Parkinsonism is common. Such residua may be of any of the above described forms. In fact, the combinations are at times bewildering. In one of my cases, a girl, five years after the attack, there are now present: mask-face, muscular jerks, recurring attacks of lethargy, spasmodic fixations of the jaw, unequal pupils, nystagmus, loss of convergence, nocturnal restlessness and excitement, left foot-drop —with inversion. With regard to this curious last-named feature Collier [138] has shown a very similar case in a woman of this type in whom foot-drop was also present.

3. As regards onset and progress, it is obvious from what has already been said that this is very different from what is familiar in presenile paralysis agitans. The mask-face is, as a rule, of somewhat slow and later development in paralysis agitans. In Parkinsonism it is early and often almost sudden in appearance. As to course and progress, it is yet too early to know how these cases of Parkinsonism will eventuate; but at least some of them in this country have shown no tendency to get worse whilst under observation for four or five years, and a few have shown distinct if slight improvement.

Bing and Staehelin,[139] out of 73 cases, saw Parkinsonism chiefly in the lethargic forms, and none in those cases in which excito-motor phenomena predominated.

MORBID ANATOMY OF RESIDUA.

The question as to the site and nature of the processes which give rise to the various later manifestations is one which is at present receiving widespread attention on all sides. Whilst much of this is still unsettled, and even in certain respects controversial, certain facts have come to light which are of considerable interest.

In 1919 Buzzard and Greenfield [27] in this country described "calcareous degeneration of the vessel walls and clots" in the brain of a fatal case. In the basal ganglia there were "very many calcareous deposits in the walls or lumen of larger thrombosed vessels," "depositions of lime salts in perivascular bleedings," &c. In one specimen the vessel walls were so thick and calcareous as to cause trouble in cutting sections. Buzzard at that time suggested that the late clinical complications might be due to secondary vascular disturbances. In 1921 Dürck [139] examined the brains of 15 fatal cases of epidemic encephalitis. He found marked calcification in 12 of them. The ages of the patients ranged from 20 to 60 years; duration of disease, eight days to five weeks. There was no ordinary athero-sclerosis of the cerebral vessels in any of them. The deposits of calcium were found in three forms: (*a*) less commonly, as incrustations around ganglion cells; (*b*) as free flakes in the tissue substance; and (*c*) as deposits in the vessel walls. The two latter were very much the commoner. These changes were well marked in a case which had only lived for eight days. This early appearance may explain the occurrence of early Parkinsonism. It is comparable, in rapidity of occurrence, to the similar calcium deposits which Herzog [140] found in the tunica media of the small and middle-sized vessels of the brain within 4 to 11 days, after poisoning by coal-gas. A similar early calcification is found in the renal tubules after poisoning by mercurial salts.

Another point which Dürck calls attention to is the sharp limitation of calcium deposition to certain circumscribed areas. These do not correspond with the areas of highest toxi-infectious damage. There may, or may not, be preceding hyaline changes in the vessel wall. The calcification is found chiefly in the media and inner part of the adventitia. The intima is only involved later if at all. These findings have been confirmed by others. Schminke,[141] in two cases of encephalitis in children, attributed nodules of softening to calcification of vessels. Symonds [68] saw marked hyaline changes in Parkinsonism with some calcification in the corpus striatum. Greenfield (personal communication) has recently found extensive calcification in parts of the globus pallidus in a similar case. He also notes the limitation of these changes to circumscribed areas.

It is thus evident that the original observation of Buzzard and Greenfield, in 1919, that acute calcification of the cerebral vessels is produced by epidemic encephalitis has been amply confirmed, and that, as Buzzard suggested, the residual troubles may be due to interference with the circulation. As yet the exact site or sites, interference with which leads to Parkinsonism in the one case and paralysis agitans in the other, has not been agreed upon. The work of Kinnier Wilson on progressive lenticular degeneration, O. and C. Vogt and Ramsay Hunt on paralysis agitans points to changes in the corpus striatum. Trétiakoff, Souques, and Lhermitte, however, find constant changes in the substantia nigra in that disease. Whether either or both these sites are necessarily involved remains to be settled.

RELATION TO CHOREA.

The similarity of some encephalitic cases to Sydenham's chorea gravis has been already referred to. The connexion between the two may lie in the site affected and the nature of the lesion. Greenfield and Wolfsohn [106B] recently reported upon the microscopic changes in the brain from a case of acute chorea under R. Hutchison. The child died ten days after onset. Vegetations were present on the endocardium. They found the chief lesions in the head of the left caudate nucleus, but the whole of the basal ganglia, cortex, and centrum ovale were affected to some extent. The congestion of the vessels, the emergence of small round cells from the walls of the capillaries, and the diffuse neuronophagy resembled very closely the picture of encephalitis lethargica in the earlier stages, which Greenfield [27] has described.

CONCLUSION.

Considering its comparatively light incidence upon the population this disease has caused a large amount of death and suffering. As yet no means of preventing or checking it is known. It is to be hoped that some increased knowledge of many obscure nervous disorders may arise from the many stimuli to their investigation which it has provided.

In conclusion, I desire to express my grateful thanks to each and all of many friends who have given valued assistance in preparing these lectures, particularly to the Ministry of Health for much help, and, not least, for the invaluable bibliography contained in its recent report.

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THE IMPORTANCE OF PROTEIN HYPERSENSITIVITY

IN THE DIAGNOSIS AND TREATMENT OF A SPECIAL GROUP OF EPILEPTICS.

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In Collaboration with

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THE possibility of food poisons or food susceptibility as a factor in the ætiology of certain forms of epilepsy has been advocated for many years. The basic idea is, therefore, by no means new, and we do not wish to claim any originality. The subject of protein hypersensitivity and its relation to asthma, urticaria, migraine, &c., has engaged the attention of one of us (R. L. M. W.) for several years. The application of such tests to cases recognised as a special type of epilepsy was suggested by Sir Maurice Craig over two years ago. The clinical aspects of such a group were recorded by him, and he has kept in touch with all the cases investigated. The whole subject teems with interest and offers a wide field for further research along certain definite lines. We submit the results of these investigations with due regard to our inability to interpret them in the light of our present knowledge, which inability we regard as inevitable, although it is a matter for regret. The research is being continued,[1] and this paper, therefore, is in the nature of a preliminary communication.

Protein Hypersensitivity Tests.

All the tests have been carried out with proteins prepared by R. L. M. W. under certain definite conditions. In many cases pure crystalline proteins have been isolated from various foodstuffs, and these have been grouped together. As a result we have five groups of proteins which are used for purposes of testing food protein sensitivity. These groups consist of:—

(1) Egg proteins: crystalline egg albumin of various types; (2) meat and fish proteins: from beef, mutton, veal, chicken, game, fish, shell-fish, &c.; (3) milk of various animals; (4) vegetable proteins: ground-nut, vegetables, fruits, nuts, legumes; (5) cereals, including all the common types of cereal proteins; (6) peptone; (7) control: a solution of decinormal sodium hydroxide.

These proteins, as far as possible, are kept in the solid form in a refrigerator and weighed out into sterile test-tubes before use. They are dissolved in freshly prepared decinormal soda, 20 mg. to 10 c.cm. of soda being the usual strength for the purposes of the tests. As the solutions deteriorate on standing, they are made up fresh every day, especially in the summer months, and, as far as possible, all the patients are tested on the same day. The tests are done on the forearm by first cleansing the flexor surface with alcohol or ether and applying a small drop of the testing solution. The skin surface is just broken by gentle scratching with a blunt-pointed scalpel or needle, care being taken to avoid any bleeding. The six or seven tests are applied to the skin, and a control with decinormal sodium hydroxide is also carried out. A positive reaction appears obvious almost immediately after the scratching has been completed, since in 15 seconds an area of hyperæmia appears, which spreads outwards and usually extends over an area the size of half-a-crown. After leaving the protein solutions in contact with the broken skin for 10 minutes they are washed off and the results of the skin test noted. In cases where a positive reaction has occurred a small but definite wheal appears, which still retains its hyperæmic area around it. The negative tests and controls often disappear so rapidly that it is difficult to see where they have been applied. To make certain of the positive reaction we usually apply a clean glass microscope slide to each test and note whether the hyperæmic area can be blanched by pressure alone. In true positive reactions this does not occur.

The question of the best time to do the tests is of the greatest importance. Our observations tend to show that the tests succeed best when the patient is not fatigued. It was found that the sensitivity of patients to proteins varies considerably, according to the time when they are carried out. It so happened that two epileptics were tested immediately before a fit, and in both cases they reacted strongly to proteins (one to the five groups of proteins, the other to three groups). After the fits the sensitivity to a particular protein may disappear, but the time that elapses before the patient becomes desensitised varies. An epileptic has been found to be negative to all proteins within 3½ hours after a fit, while in others the time is considerably longer. In those patients who have fits over a period of some days we have found that at the commencement of the attack they remain sensitive, but at the end of the attack they no longer react. The best time, therefore, is just before an attack (though immediately before an attack a patient may be hypersensitive and may react to all proteins) or as long an interval as possible after the previous one.

Treatment.

Treatment comes under two headings. In private practice the ideal method can be applied, which consists in removing the offending protein or proteins from the patient's dietary, and, if necessary, in desensitising the patient by the administration of protein vaccines in small and graduated doses. In a mental hospital, where patients are segregated together, it is often found difficult to eliminate the particular food, though it is hoped that this may be tried in certain cases. Peptone[2] given by the mouth is of value to patients sensitive to that particular peptone. Cereal vaccines are being given to the patients at Hanwell, who have been found to be sensitive to cereals, but it is too early to report any definite results at present.

Summary of Results.

The tests for protein hypersensitivity have been carried out on sane patients in private practice and on patients in a mental hospital suffering from epilepsy with insanity. The patients in private practice were selected from clinical experience as a general rule. They appear to be quite healthy persons, usually inclined to obesity, and not excitable or markedly unstable. This grouping of the symptoms was described by Sir Maurice Craig as characteristic of the particular type discussed in this paper. It enabled him to select the right type of case for investigation, as shown by the frequency of positive results to the protein skin tests in his cases. This class does not respond to bromides; this observation alone may suggest the group to which the patient belongs. Again, many patients complain of digestive disturbances and are brought by anxious relatives for an opinion as to the diet the patient should be given. The patients at Hanwell suffering from epilepsy with insanity were not selected. All epileptics, except the very old and those with congenital imbecility, were examined. Tests were carried out on 122 epileptics

[1] The research was extended subsequently to Hanwell Mental Hospital, where the patients were under controlled conditions.

[2] This peptone is given in the form of gelatin capsules, each containing 1 gr. of peptone. One gr. twice a day after food has been found sufficient for this purpose. It is most important to give it after food, not before. Further, some cases react very strongly, so that the dose has to be diminished or suspended for some days. The best preparation we have found is that known as medicinal peptone.

(68 females and 54 males). Of these, 46 (28 females, 18 males) gave positive reactions to different proteins, while 76 (40 females and 36 males) did not react at all. These results are in accordance with our contention that only a certain type of epileptic shows protein hypersensitivity. Only a very few in this series corresponded clinically to the type described by Sir Maurice Craig. In this series of epileptics tested at Hanwell it was found that 28 patients reacted to peptone, 15 to cereals, 15 to fish and meat, 9 to vegetables, 9 to eggs, and 3 to milk. A large number of non-epileptics react to protein hypersensitivity also, and this has been observed in patients suffering from asthma, urticaria, migraine, &c. At Hanwell control tests were performed on 100 persons, of whom 13 were staff, and 70 were cases of dementia præcox, the remainder consisting of other types of insanity. All the tests proved negative, with the exception of four cases of dementia præcox, who reacted slightly to peptone.

The result of these observations has shown conclusively that in some cases where it has been possible to adjust the diet on the basis of skin tests, no further treatment has been necessary. The work carried out at Hanwell has emphasised the difficulties of the dietetic treatment, and made necessary the production of a reliable substitute, but so far we have not been able to fix the dosage suitable for each individual case.

Peptone was given orally to 24 patients. In some cases the fits have become less frequent, and, in a small proportion of cases, there has been some mental improvement as well. In two cases the peptone made them decidedly worse—i.e., they became confused and "lost"; after the treatment by peptone it was found that some patients were no longer sensitive to that particular peptone. We found that some patients reacted more favourably to peptone when the dose was reduced from 2 gr. twice a day to 2 gr. once a day. The control of the fits and the associated mental condition does depend to a large extent on the dosage of peptone given, and in this respect resembles bromide treatment. It is possible that, with smaller does, the patients may be controlled just in the same way as with bromides in certain types of epilepsy. With regard to the length of time the treatment should continue, we are at present unable to give a satisfactory answer. Again, we cannot say when a patient exhibiting an idiosyncrasy to one or more foods can with safety resume a normal diet.

The tests serve as a guide not only to diagnosis, but also to treatment. Those patients who have shown signs of improvement with peptone are usually those who have recently been admitted to the Mental Hospital. This can possibly be explained by the fact that the central nervous system is not damaged to the same extent as in a patient with a prolonged history of epilepsy. The difference in the results obtained in private practice, as compared with those in asylum practice, is no doubt due to difficulty of controlling the diet in the latter and the actual deterioration caused to the central nervous system through constant seizures.

This is one reason for urging the importance of early diagnosis of this type of epilepsy in the hope of preventing further attacks. That there is foundation for this would appear to be well illustrated by the cases which we have cited. It seems to us that by the application of the protein skin tests we have valuable confirmatory evidence of the possibility of a case of epilepsy falling into this group. The more our knowledge is extended, and the more we can group accurately, so much the better for treatment. Our special group is clearly one which has attracted attention throughout the ages. Since this type of epilepsy begins in early life, the secret of success is early diagnosis. In asylum practice this is impossible, and so vitiates good results. The diagnosis and treatment by means of skin tests, peptone, and diet applies only to one special type, and we do not wish to convey the impression that we have a panacea for all types of epilepsy. As to the mode of action of the proteins, certain explanations offer themselves to us, but we consider them far too speculative with our present knowledge. The condition known as migraine, and its association with food poisons and food idiosyncrasy, is of particular interest in this connexion, and its ready response to dietetic treatment has been observed by us. The production of epileptic seizures in one group and attacks of migraine are so closely allied as to suggest a common pathological change in the two conditions.

Illustrative Cases.

The following are illustrative cases:—

CASE 1.—Male, aged 37, under care of Sir Maurice Craig. Fits began at 29; has had 14 fits in eight years. When first seen and tested, June 17th, 1921, was found to be sensitive to egg proteins. This reaction was very definite and coincided exactly with the history, and with the patient's natural dislike of eggs. A survey of the 14 fits, and their time of occurrence, gave clear evidence of the close connexion with eggs in the diet. On restriction of diet by exclusion of eggs in all forms only two fits occurred, and these were traced to the patient taking custard by accident. For nearly a year this patient has been quite free from fits, has had no bromides or sedatives of any kind, and has been able to carry on his work without interruption and no signs of impending fits.

CASE 2.—Male, aged 16½ years, under care of Sir Maurice Craig. Fits commenced at 12 years; he has suffered from repeated seizures ever since. Three weeks before being tested had a fit. The tests showed a definite sensitivity to milk protein. The attack three weeks previously followed on a long walk at the end of which he felt thirsty and consumed two glasses of milk at a dairy on his way home; the fit began just one hour after he had consumed the fresh milk. The patient was not aware of any idiosyncrasy to milk, but on a diet free from milk has had no further attacks, and is still under treatment.

CASE 3.—Female, aged 15. Tested on June 10th, 1922, she reacted to vegetables, fruits, and cereals. On a diet free from these she has only had one fit since, and this occurred after she had been given salad by mistake.

CASE 4.—Female, aged 21. Has suffered from fits for some years. In association with the fits she has urticaria. Appears quite healthy and is inclined to obesity. Tests showed a well-marked reaction to cereals, and also to peptone. Since commencement of treatment by diet and peptone has had two attacks of grand mal, traceable to errors in diet, occurring when she was over-fatigued. There were no epileptic equivalents after these two attacks, which were of short duration, and mental recovery was much more rapid than previously. Since August 30th has been quite free from attacks, and is now much better. Under bromide treatment for many years, without any influence over the fits. In addition she has taken luminal, 2 gr. nightly, for some time without effect in reducing either the number or severity of the attacks.

CASE 5.—Male, aged 5½, under care of Sir Maurice Craig. Suffered from petit mal for three years, uncontrolled by bromides. Was found to be sensitive to eggs, and also to vegetables. These articles of food were found to be the chief constituents of his diet; on their removal fits became less, and finally disappeared. There have been no attacks for nearly a year, and the improvement in the boy's condition, both physical and mental, is very well marked. With the exception of a slight tendency to excitability, he appears to be a normal healthy boy.

CASE 6.—Male, aged 14, under care of Sir Maurice Craig. His first seizure, 15 months previously to being seen, was severe and accompanied by signs and symptoms which led to the diagnosis of ptomaine poisoning. Skin tests showed him to be sensitive to vegetables and fruits; his diet was adjusted accordingly, and he remained free from fits for nearly six months. A severe seizure followed the eating of mushrooms; during this attack, the patient was re-tested, with negative results. Examinations of the blood, urine, and stools gave no evidence of pancreatic or hepatic insufficiency. The patient is still under treatment, and so far has had only one attack, of short duration.

CASE 7.—Female, aged 5½, under care of Sir Maurice Craig. Had attacks of petit mal with great regularity since 1½ years of age. The tests showed a very definite sensitivity to cereal proteins. The mother, who proved an admirable witness, stated that whenever she gave the child oatmeal her stomach became enormously distended and a seizure followed. Removal of all cereals from diet followed by complete disappearance of distension and petit mal; this condition is maintained after 18 months without any further treatment, and more particularly exclusion of bromides.

Illustrative Cases of Patients Treated with Peptone.

CASE 8.—Female, aged 39; tests showed definite sensitivity to peptone and cereals. Peptone was given, 2 gr. b.d., from June 6th, 1922. At first the patient became very lost, confused, and spiteful; since August she has improved both mentally and physically, and has put on 6 lb. in weight. She is neither lost nor spiteful now, and is working. Fits are less frequent. Does not now react to peptone.

CASE 9.—Female, aged 27; showed sensitivity to peptone and, very markedly, to cereals. Two gr. peptone b.d. from June 6th, 1922. Worse on treatment at first; she became very confused, troublesome, and depressed. Is now much brighter mentally, but continues to have fairly frequent attacks of petit mal, though by no means so many as she had previously.

CASE 10.—Female, aged 33; tests showed sensitivity to fish and meat and peptone. Peptone 2 gr. b.d. from June 6th, 1922. Patient subject to frequent screaming attacks; during first fortnight of treatment she became extremely abusive, and mistook identities, but she was free from screaming attacks. In August she was very much better, but the screaming attacks returned, though not so frequent. The fits are less frequent, and mentally she is much clearer than she used to be. When tested last, on Oct. 22nd, she failed to react to peptone, but still reacted to fish and meat.

CASE 11.—Male, aged 27; tests showed a sensitivity to peptone, given orally 2 gr. b.d. from June 6th, 1922. Mentally he remains the same, but his fits are fewer. He used to have fits in batches, but since treatment has not had a batch.

CASE 12.—Male, aged 37; tests showed a sensitivity to peptone and cereals. Peptone 2 gr. from June 6th, 1922. At first the fits became more frequent, but now they are less. He is not so irritable, and there is little confusion after fits. Mentally he has improved.

CASE 13.—Male, aged 19; tests showed sensitivity to peptone and cereals. Peptone given from Sept. 14th, 1922. From being in a state of gross confusion he was able to get up, and was working within a week of the treatment being started. His fits are less frequent, but recently he has had a relapse, and died in status epilepticus.

We would express our indebtedness to Sir Maurice Craig for the help and advice he has so willingly given us, and also for his encouragement and interest. In allowing us to carry out the investigations at Hanwell, we would offer our grateful thanks to the committee of the Hanwell Mental Hospital, and to the medical superintendent, Dr. A. W. Daniel. To the nursing staff of the hospital we owe our indebtedness for the careful records they have kept of the patients under treatment, and for their hearty coöperation.

SOME CONGENITAL ANOMALIES OF THE EYE

AND THEIR CONFUSION WITH ACQUIRED CONDITIONS.[1]

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THE eye, in common with the rest of the body, is not exempt from the liability to occasional imperfect or aberrant development, with this difference, however, that whereas congenital malformations in other parts, such, for instance, as hare-lip, spina bifida, or imperforate anus, are usually self-evident as errors of development and easily diagnosable, the lesser abnormalities of the eye may sometimes closely simulate pathological states. Failure to recognise their congenital origin may thus lead to misapprehension and in some cases to much unnecessary anxiety on the part of the practitioner. This apparent difference is no doubt partly due to the ease and minuteness with which the eye can be examined, so that less degrees of departure from the normal will be recognised in the eye than is possible in other parts, and partly to the fact that, the defects being in many cases invisible without an ophthalmoscope, they escape the notice of the patient or his relatives until discovered by examination.

Naturally, as in other parts, there are also gross errors of development of the eye which are immediately evident at birth (such as microphthalmia, crytophthalmia, and cyclopia). These do not require description here, since they are obviously developmental and are unlikely to be confused with anything else or to demand treatment. It is the smaller anomalies, in themselves of no clinical value, which may easily be confused with pathological conditions of grave import.

Differential Diagnosis of Congenital Abnormalities from Affections of the Fundus Oculi.

Affections of the fundus will be dealt with first, since they present by far the most difficult diagnostic problems.

From Papillœdema.

A young patient may come to his doctor complaining of increasing headache, irritability, and inability to concentrate on work. In the course of the examination, which reveals no definite physical signs, the eyes are inspected. There is no external abnormality and the patient states that his vision has been good, but that lately he has noticed occasional mistiness. On ophthalmoscopic examination it is seen that the edges of the optic disc are blurred and that it is distinctly redder than normal. The question at once arises as to whether this is a case of early papillœdema from cerebral tumour, and this diagnosis may easily be made if one forgets the existence of the congenital condition known as pseudo-neuritis.

Pseudo-neuritis is generally associated with hypermetropia, sometimes of high degree (6 D. or more), but not necessarily. This hypermetropia will give rise to severe headache, blurring of vision on close work, lassitude, and the whole train of symptoms of asthenopia, which, when taken in conjunction with an apparent early papillœdema, may easily simulate signs of raised intracranial pressure. The differential diagnosis rests on the following facts. Pseudo-neuritis is almost invariably associated with hypermetropia. The swelling of the disc is more apparent than real. There are no hæmorrhages and no exudate. The appearance is absolutely stationary and the symptoms can be completely relieved by correcting the hypermetropia. A cerebral tumour sufficiently advanced to cause papillœdema will almost certainly have given rise to vomiting as well as headache, but a swelling of two dioptres or more is certainly pathological and pseudo-neuritis should not be diagnosed.

One should bear in mind in considering the diagnosis of papillœdema the fact that apparent blurring of the upper and lower edges of the disc is often seen in high degrees of astigmatism and is merely an optical effect caused by the impossibility of focusing all parts of the disc distinctly at the same time. As regards the colour of the disc, it should be remembered that it is very variable, normal degrees of vascularity shading imperceptibly into states of definite hyperæmia. Generally dark-complexioned people have discs of richer colour than blondes. The very variable pigment ring round the disc should not be mistaken for a pathological condition.

From Glaucoma.

Another and rarer condition of the disc may cause anxiety by confusion with the cup seen in chronic glaucoma. In the true glaucomatous cup the vessels can be faintly seen emerging from the centre of the disc at the bottom of the cup and curling over the overhanging edge, while the field of vision shows contraction, especially on the nasal side, though central vision may be of normal acuity. In the congenital condition which resembles this all the vessels emerge round the edge of the disc and no central vessels can be seen. Sometimes the surface of the disc is level and sometimes deeply depressed below the surface of the retina (coloboma of the disc),

[1] An address read at the meeting of the London Association of the Federation of Medical Women held on April 10th.

in which case the appearance much resembles a glaucoma cup, but is often much deeper and more irregular, and may show pigmentary deposits. It is interesting to note that a cupped disc with vessels emerging round the periphery is normal among most of the Carnivora. The visual acuity in these congenital cases may be normal or diminished. In one case seen by me there was also a coloboma of the choroid below the disc, which gave rise to a marked defect in the upper part of the field of vision. The typical appearance of this coloboma, however, made the congenital origin a matter of certainty.

An abnormally deep physiological cup will not be confused with a glaucoma cup if it be remembered that in glaucoma the margin of the cup is at the margin of the disc (though the disc may be surrounded by a white ring of exposed sclera), while in a deep physiological cup there is always a rim of normal disc round the periphery.

From Glioma Retinæ.

One is often confronted with infants brought because the mother fancies there is something wrong with the child's eyes. She may even have noticed a peculiar sheen in the pupil. Other conditions besides glioma of the retina should then be borne in mind. The congenital conditions most likely to cause doubt are the various degrees of persistent hyaloid artery. In well-marked cases a vessel stretches through the vitreous from the optic disc to the posterior surface of the lens. Here it may appear only as a small central opacity in the pupil, or it may be associated with persistence of the posterior part of the vascular capsule of the lens, in which case the back of the lens will be seen covered with a more or less shining membrane in which blood-vessels can be seen. This appearance much resembles a mass of vascular new growth in the vitreous, but it must be remembered that in glioma retinæ the tension in the posterior part of the eye is increased and the lens and iris pushed forwards, so that the anterior chamber is very shallow, while in persistent hyaloid artery the anterior chamber is normal or even deeper than normal.

In less marked cases the posterior part of the lens is unaffected and only the proximal part of the artery persists. It may be seen as a cord-like structure stretching forward from the disc, sometimes containing blood and sometimes veiled with a film of connective tissue, which may also extend over the branches of the *Arteria centralis retinæ* on the disc. This appearance may resemble a new growth, but it lacks the golden and clear-cut appearance of early glioma and there are no satellite growths scattered over the retina. It is a point of anatomical interest that the hyaloid artery normally breaks up into several branches in the vitreous before reaching the lens. In two human embryos which I have examined there were five branches spreading out in a fan from the main trunk. If more than one of these branches persists the condition may be mistaken for *retinitis proliferans.*

From Retinitis and Choroiditis.

The diagnosis and prognosis of general conditions, particularly those associated with arterio-sclerosis, albuminuria, or syphilis, are often materially assisted by an examination of the *fundus oculi.* In such cases the physician is particularly on the look-out for hæmorrhages, white patches of exudate, pigmentary disturbances, and areas of choroidal atrophy. Here, again, congenital defect sets a snare for the unwary. In the first place, the presence of *opaque nerve fibres* either at the edges of the disc or in patches along the course of the larger vessels may be extremely misleading. Unless excessive they cause no symptoms, so no help can be derived from the history. In appearance they are feathery white finely-striated patches of varying size, always with a fringed appearance at their peripheral edges. There is no disturbance of the retina apart from them and the vessels are usually normal, though, of course, arterio-sclerosis may coexist. They are very likely to be mistaken for patches of exudate, though these latter are always more creamy in tint, soft and fluffy in texture, and show no peripheral striation. They may frequently be seen to involve the deeper layers of the retina, whereas opaque nerve fibres are superficial. Exudate is almost always associated with hæmorrhages and changes in the vessels and is often accompanied by a "macular fan," while it is rare for opaque nerve fibres to involve the macula, and if they do so it is in the form of a dense white patch and not a fan-shaped figure.

Hæmorrhages from the retinal vessels are usually quite straightforward, but there is a curious and rare condition which may be confused with them. This anatomical peculiarity is known as a choroido-vaginal vein (or posterior vortex vein). Such a vessel is a very large choroidal vein which collects blood from a variable area of the choroid and leaves the eye in the neighbourhood of the optic disc. It is very broad (sometimes as much as half the diameter of the disc) and lies on a deeper plane than the retinal vessels. Like the smaller choroidal vessels which are sometimes visible it has no light streak, but is flat, lustreless, and ribbon-like. Its large size, deep red colour, and lack of reflex make it look very like a patch of extravasated blood, but if it be examined carefully it will be seen to be a large vessel, and pressure on the eyeball will cause it to empty and disappear. Such choroido-vaginal veins occur most often in myopes, though they have been seen in poorly pigmented emmetropic and hypermetropic eyes. They sometimes leave the eye through the floor of a myopic crescent.

Patches of *choroiditis* are often of great diagnostic importance. They appear, unless seen early in the active stage, as glistening white areas surrounded by irregular heapings of black pigment. The retinal vessels often pass over them, but choroidal vessels are absent. The patches are usually multiple and vary in shape and size. Confusion may arise between patches of atrophy from choroiditis and one or other of the forms of *congenital coloboma of the choroid.* In coloboma the chorio-capillaris is absent over a portion of the fundus. Both choroidal and retinal vessels may be seen coursing over the white floor of the coloboma. They are usually small. The coloboma may be ectatic; patches of choroiditis, except in high myopia, are level or nearly so. Scattered pigment may be present or there may be a thin line of pigment at the edge of the coloboma, but there is not the exuberant heaping up of pigment seen in choroiditis. In coloboma there is only one patch and it is most often situated below the disc, with its greatest diameter in the vertical. Its anterior edge is frequently not seen, though it may reach to the edge of the pupil, constituting a coloboma of the iris.

Colobomata may occur in atypical situations and hence be misleading. The most important of these is the macular coloboma, which is rare and somewhat of an embryological puzzle. It much resembles a single patch of central choroiditis. It is usually horizontally oval, the edges are sharp, it is often surrounded by a yellowish zone, and it may be pigmented. There may be a history of defective vision from birth but not necessarily, and it may occasionally be extremely hard to diagnose. The chief features are that it is absolutely stationary and it is the only patch seen. The so-called Fuchs's coloboma is a white crescentic area below the disc and is due to an anomaly of development of the upper end of the choroidal fissure. It is usually found in hypermetropic eyes and is not likely to be mistaken for anything else unless its white colour and the patient's poor visual acuity (from the refractive error) lead to a suspicion of atrophy.

Pigmentary Disturbances.—These occur with frequency in choroiditis, retinitis, and high myopia. Congenital anomalies of pigmentation may be either in the direction of excess or deficiency. The variable

pigmentation at the edge of the disc has been referred to above. Pigment in this situation, even when in isolated masses, is seldom pathological unless accompanied by signs of exudate or choroidal atrophy. The amount of pigmentation seen over the retina varies with the complexion of the individual, from the almost chocolate colour of the negro's fundus to the bright red apparently pigment-free albinotic eye.

On the whole, then, the differential diagnosis of intraocular congenital anomalies rests on the observation of minute details of their structure and colour and to a certain extent on the appreciation of their stationary nature, though it is often undesirable to postpone an opinion until this last point has been verified.

Differential Diagnosis of Anomalies of Parts Anterior to the Vitreous.

Anomalies of the parts of the eye anterior to the vitreous are also apt to give rise to difficulty, though on the whole their congenital nature is more obvious, both because the history is of some value and the parts concerned are more easily examined.

From Iritis.

The chief signs of old iritic mischief which may lead to confusion with congenital conditions are the irregularity of the pupil, the presence of organised exudate and adhesions to the anterior capsule of the lens, and the alteration in colour of the affected eye as compared with the other in unilateral cases.

Irregularity of the Pupil.—In the first place, one must mention the condition of coloboma of the iris. Here the pupil is pear-shaped or oval with the narrower part usually below, though not always. The defect may be complete—i.e., a forward continuation of a coloboma of the choroid, or incomplete and not extending to the root of the iris, or there may be a narrow bridge of iris uniting the two margins of the cleft at one point. Here the possible occurrence of fundus abnormality, the absence of adhesion of the iris to the lens, and the dilatation of the pupil under atropine and, if one may use a paradox, the regular irregularity of its shape, will assist the diagnosis.

In other cases the congenital malformation of the iris may take the form of extra holes beside the pupil, which itself may be abnormal in shape (polycoria). There is most frequently one extra hole near the pupil, the slender bridge of iris separating it sometimes resembling a band of organised exudate subdividing a normal pupil. Here a drop of atropine will help matters. In polycoria the primary pupil dilates and the accessory one merely alters in shape passively since it possesses no sphincter. In iritis with a band-like adhesion both the parts of the pupil will dilate except where they are held by the adhesion. A single pupil may sometimes be seen much displaced, usually up and in (corectopia). Here the light reaction is normal.

True *adhesions of the iris* to the anterior capsule of the lens may occasionally be found in cases of polycoria and corectopia. More commonly, however, they are simulated by tags of persistent pupillary membrane. These may vary from fine filaments scarcely visible to fairly dense bands crossing the pupil and sometimes passing forward to the back of the cornea. Their true nature can always be recognised by observing that they are attached to the anterior surface of the iris a little way from the margin (the *circulus iridis minor*), whereas inflammatory synechiæ always come from the edge of the pupil. Occasionally these tags of persistent pupillary membrane disappear during childhood, but leave behind them a very regular arrangement of brown pigment dots on the front of the lens. These differ from the pigment spots left by broken-down inflammatory synechiæ in their regularity and small size.

Congenital *heterochromia iridis* is occasionally seen, either one iris being of a different colour from the other or different parts of the same iris varying in tint. The absence of signs of inflammation and atrophy will be noted.

From Results of Trauma.

Some of the above conditions may also resemble the results of trauma. The converse of this was well shown in a case seen recently in which the iris presented the appearance of a small clean-cut oval hole to the nasal side of the pupil, whence the possibility of polycoria. Only the history and the presence of a minute white opacity in the cornea immediately opposite the hole served to show that it had been caused by a perforating wound many years before. Coloboma of the upper or lower lid may occur in the form of a small notch, usually to the inner side of the mid-line of the eye. The eyelashes are absent in the coloboma. These defects in the lower lid are frequently associated with defective development of the malar bone. Various other anomalies, such as dermoids, skin bridges from the lids to the globe, coloboma of the iris, corneal opacities, &c., are often associated with congenital clefts of the lids.

The presence of corneal opacities must not be taken as absolute evidence of past inflammation or trauma since they may be congenital. The question as to whether they are truly developmental or are due to intra-uterine inflammation or trauma is debatable.

Coloboma of the lens may or may not be associated with coloboma of the iris. If it is not and the patient happens to come up with a history of injury, it is possible that the edge of the coloboma seen in the pupil may be mistaken for the edge of a dislocated normal lens: it is to be remarked, however, that the curve of the edge of a colobomatous lens is concave towards the pupil margin while that of a dislocated lens is convex. A congenitally dislocated lens may be very misleading in this connexion, though the history of poor vision from birth may help. Congenital dislocation of the lens appears to predispose to acute glaucoma.

From Disorders of the Motor Mechanism of the Eye.

In this group I have included those congenital conditions which simulate on the one hand acquired disease of the central nervous system, and on the other the common condition of concomitant squint.

Congenital ptosis may be unilateral or bilateral. It is often incomplete, the pupil being not quite covered. In slight cases the lids may show movements associated with those of mastication and deglutition (synkinesis), but no independent movement. In more marked cases there is defective upward movement of the eye. In all cases of congenital ptosis the pupil reactions and the accommodation are normal, and this fact is perhaps the most important in their diagnosis. Confusion may arise in cases seen apropos of other non-associated symptoms, where the history is vague. In these cases one has to think of the possibility of a syphilitic syndrome, or of myasthenia gravis, incipient bulbar palsy, cerebral tumour, or abscess. The fact that one eye only is affected does not in itself exclude early myasthenia gravis, as, in a case which I saw recently, a unilateral ptosis preceded the appearance of weakness in the tongue and lips and the other eye by several months. In this case the amount of ptosis was variable and there was rapid improvement under strychnine.

In practically every other condition which may be confused with congenital ptosis there is involvement of some or all of the other muscles supplied by the third nerve, and the pupil reactions are invariably affected. In cases of congenital ptosis which are hereditary there is usually marked limitation of movement of the globe and also sometimes nystagmus, but in all the cases so far reported pupil reactions and accommodation were normal.

Congenital defect of any one of the eye movements may occur alone, and in these cases the defect may be due to various anatomical causes, such as defective development of the muscle at fault, its abnormal

insertion or bifurcation, and absence or aplasia of the nerve. The resulting squint can be differentiated from a concomitant squint by the fact that the relation of the visual axes to each other is not the same in all positions of the eye, and from a true paralytic squint by the absence of secondary contracture and of diplopia, and, frequently, the presence of nystagmus.

Inequality of the pupils is often a valuable diagnostic sign, but it should be remembered that it may accompany marked dissimilarity in the refraction of the two eyes. In these cases it varies from time to time, and becomes less when the correcting glasses are worn.

Nystagmus dating from birth is associated with some defect of the eye which hinders the development of central fixation. Such defects should be carefully looked for in considering all cases of nystagmus. The commonest are opacities in the media (especially the lens and the cornea, either congenital or due to ophthalmia neonatorum), albinism, and occasionally complete colour blindness or aniridia. The presence of any of these will help to allay suspicions of disseminated sclerosis, cerebellar lesions, or Friedreich's ataxia. Congenital nystagmus is not accompanied by the sensation of movement of objects looked at and of vertigo, whereas acquired nystagmus frequently is.

From Melanotic Sarcoma.

There are two conditions which may give rise to grave suspicions of melanotic sarcoma if they are accidentally discovered during a routine examination. They cause no symptoms, but neither does an early sarcoma. The first of these is the presence of clusters of small deeply pigmented nodules at the edge of the iris. They are sometimes likened to bunches of grapes (Traubenkörner) and are of normal occurrence in horses. Their position and the fact that they do not appear to infiltrate the iris but rather hang from its edge may help to distinguish them.

The second condition consists of the presence of one or more small black dots in or just under the conjunctiva, often at the site of perforation of the anterior ciliary vessels. A faint dusky patch is often seen here in dark-complexioned people, but occasionally a definite black nodule is formed. These should always be carefully watched, since, though, like "moles" elsewhere, they may remain quiescent permanently, there is always just a possibility that they may enlarge, when they must be viewed with suspicion and submitted to treatment.

Other Congenital Conditions of Interest.

There are two conditions dating from birth which are interesting as they resemble senile changes, though they are of little diagnostic importance. The first is the presence of a white ring-like opacity in the cornea exactly resembling an *arcus senilis*. The second is congenital ectropion of the lower lid. This occasionally resembles the senile condition but may look like scarring. Ectropion of the lower lid is normal in St. Bernard dogs. The opposite condition—namely, entropion of the lids—is sometimes seen to occur congenitally. It is, of course, liable on superficial examination to be mistaken for trachoma, but the absence of granules or scars on the tarsal plate will distinguish it, even in the presence of pannus which may be caused by the rubbing of the lashes against the cornea.

Finally, there is a misleading condition of which I recently saw a good example. The patient, a woman, appeared to have a marked unilateral exophthalmos which suggested the presence of an orbital tumour. On examination, however, I found that the appearance of exophthalmos was solely due to the large size of the affected eye, which showed a refraction of −16 D., the other being practically emmetropic. The media in both eyes were quite clear and the corneæ of the same size, there being no suggestion of buphthalmos. The patient stated that the condition dated from birth and that several other members of her family were similarly affected.

HEATING OF THE TISSUES OF THE BODY BY LIGHT AND HEAT RAYS.

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RECENT experiments have revived interest in the question of the effects of the application of light, heat, and cold upon the temperature of the tissues of the body. MacLeod, Self, and Taylor,[1] and more recently MacLeod and Taylor,[2] determined the effect of the local application of heat and cold by means of electrically heated pads and glass tubes, heated or cooled with circulating water, upon the temperature of the unshaved and shaved skin of rabbits, and on the organs underlying the skin thus treated. They used thermo-electric couples mounted in hypodermic needles, and a galvanometer specially calibrated to determine the temperature of the tissue. They found that the changes produced varied with vascularity of the different tissues. Thus the temperature of the liver and the kidney was little affected by heating or cooling of the overlying skin, whilst that of the brain or of muscle was considerably altered. In no case was the general body temperature affected by such local application of heat and cold.

Sonne[3] studied the effect of the various rays of the universal light bath (Finsen), and concluded that the luminous rays heated up a very essential portion of the aggregate blood volume of the organism to a temperature possibly exceeding the highest ever measured, without causing the body temperature to rise to any appreciable degree. He found that the luminous rays heated up the cutaneous blood 5·8° C. higher than do the infra-red rays. In the case of the luminous rays the subcutaneous temperature is above the skin temperature, whereas in the case of the dark infra-red rays the skin temperature is higher than the subcutaneous temperature. Sonne employed thermo-electric couples mounted in hypodermic needles, as did MacLeod and his co-workers.

In this paper we record results of experiments in which we exposed rabbits to the rays from the sun and from a carbon arc lamp, paying particular attention to the comparative effects on the temperature of the brain and of the body in general. We also record results of experiments to determine the comparative effects of the total rays from an ordinary gas radiator, dark heat rays from the same source, and total rays from a carbon arc lamp upon the temperature of the human subcutaneous tissue. We took the temperature of the tissues in some cases by placing delicate thermometers into the tissues, and in other cases by using thermo-electric couples mounted in hypodermic needles, connected with a differential galvanometer; for this apparatus we are indebted to our colleague, Dr. E. J. Schuster.

Results from Observations upon Rabbits.

Examples of our results from observations upon rabbits are given in Tables I. to VII. In most of these observations we employed urethane as an anæsthetic; the results were not obviously affected by the anæsthetic, since they resembled results from animals without anæsthesia. In some cases the whole body of the animal was exposed to the sun's rays (Tables I., II., and IIIA), whilst in other cases the head and upper part alone were exposed to the sun, the rest of the animal being shaded (Table IIIB). From Table I. it will be seen that exposure of the whole body of the animal to the sun for about half an hour raised the temperature of all the deep tissues about 1° C., whilst one hour's further exposure of the whole animal to the sun raised the temperature of all the deep tissues to above 41° C.; the rectal temperature of this animal in the shade before the

TABLE I.

Black rabbit; urethane. May 31st, 1922.

1 Time.	2 Conditions of animal.	3 Region of body.	4 Temp. °C.
12.0	Whole body in shade.	Rectum.	38·2
		Ear.	35·0
12.5		—	—
12.35	Whole body in sun.	Rectum.	39·5
et seq.		Ear.	39·5
		Fur.*	54·0
		S.T. of back.	41·5
		Surface of brain.	39·5
12.45	Whole body in shade.	—	—
1.45		—	—
2.45	Whole body in sun.	Surface of brain.	41·0
et seq.		S.T. of thorax.	43·0
		Rectum.	42·0
		Ear.	40·5
		In thoracic cavity.	42·5
		Fur.	53·0
		In nasal cavity.†	42·5
		S.T. of back.	43·5
		Medulla, pithed with thermometer.	41·5

S.T. = Subcutaneous tissue.

* Temperature of an isolated piece of black fur in sun was 46° C.

† Temperature of an isolated piece of black fur in sun was 50° C.

TABLE II.

Rabbit; urethane. June 2nd, 1922.

1	2	3	4
11.55	Whole body in shade.	Rectum.	37·5
		S.T. of back.	37·0
		Ear.	B. 35·0
12.0		—	—
12.45	Whole body in sun.	Rectum.	39·0
et seq.		S.T. of back.	42·0
		Ear.	39·5
		Fur.	52·5*
		Nasal cavity.	40·0
1.0		Rectum.	40·0
,,		S.T. of back.	42·0
2.0	After death at 1.30.	Brain.	41·0
et seq.		Rectum.	43·0
		S.T. of back.	45·0

B. = Below.

* Temperature of an isolated piece of black fur was 56° C.

TABLE IIIA.

Grey rabbit; urethane. June 12th, 1922.

1	2	3	4
12.10	Whole body in sun.	—	—
12.39		Rectum.	38·5
		Fur.	49·0
12.45*		Ear.	40·0
12.50		Under scalp.	41·0
,,		S.T. of back.	42·0
,,		Rectum.	39·0
1.0		Cerebrum.	39·5
,,		Medulla.	39·5

* Respiration 108 per minute.

TABLE IIIB.

Grey rabbit; urethane. June 12th, 1922.

1	2	3	4
12.30	Whole body in shade.	Rectum.	37·5
12.32		—	—
1.2*	Head and upper part of body in sun.	Rectum.	36·5
et seq.		Ear.	39·0
		Fur of head.	46·5
		,, rump.	29·0
		Rectum.	36·0
1.55		Fur of head.	44·5
et seq.		Ear.	38·5
		Under scalp.	38·0
		S.T. of back (in shade).	35·5
		Cerebrum.	36·5
		Medulla.	36·5

* Respiration 60 per minute.

TABLE IV.

Grey rabbit; urethane. June 7th, 1922.

1	2	3	4
12.0	Whole body in shade.	Rectum.	39·0
		Fur.	26·0
		S.T.	38·0
12.20	Head and upper part of body 4½ ft. from carbon arc.	—	—
12.50		Fur.	61·0
et seq.		Rectum.	38·0
		S.T. of neck.	48·0
		Between skull and dura mater.	41·5
		Cerebrum.*	41·0
		Thoracic cavity.	41·0
		Rectum.	38·5
1.10	Whole body in shade.	—	—
3.0		Fur.†	26·0
et seq.		Rectum.	35·5
		S.T. of back.	B. 35·0
		Medulla.	B. 35·0

* Respiration very rapid (exceeding 100 per minute).
† Respiration normal.

TABLE V.

Grey rabbit; urethane. June 9th, 1922.

1	2	3	4
12.0	Whole body in shade.	Rectum.	37·0
		S.T. of back.	36·5
		Fur.	25·0
12.15	Head and upper part of body 4½ ft. from carbon arc.	—	—
12.30		Fur.	69·0
12.35		Under scalp.	44·5
		Ear.	41·5
12.40		Rectum.	38·0
12.45		Ear.	40·5
		Under scalp.	46·0
12.50		Between skull and dura mater.	43·0
12.55*		Cerebrum.	42·0
,,		Medulla.	40·5
,,		Rectum.	38·5

* Respiration very rapid (exceeding 100 per minute).

TABLE VI.

Grey rabbit; no anæsthetic. June 9th, 1922.

1	2	3	4
2.15	Whole body in shade.	Fur.	26·5
		Ear.	31·0
		Rectum.	40·0
		Fur between thigh and body.	38·0
2.25	Head 4½ ft. from carbon arc; rest of body shaded.	—	—
2.30		Fur of head.	69·0
,,		Ear.	43·0
2.35*		Nasal cavity.	40·5
,,		Rectum.	40·5
2.45		Ear.	43·0
2.50	Animal killed; neck broken.	—	—
		Cerebrum.	42·5
		Medulla.	41·5
		Rectum.	41·0

* Respiration very rapid (exceeding 100 per minute).

TABLE VII.

Black rabbit; no anæsthetic. June 13th, 1922.

1	2	3	4
3.0	Head 4½ ft. from carbon arc; rest of body shaded.	Rectum.	38·5
3.14		Fur of head.	55·5
3.17		Ear.	45·5
3.33		Fur of head.	67·0
,,*		Rectum.	38·5
3.37	Animal killed; neck broken.	Under scalp.	42·0
		Cerebrum.	40·0

* Respiration very rapid (exceeding 100 per minute).

experiment was 38·2° C. The ear temperature was taken in all cases by wrapping the ear round a thermometer. The fur temperature of the animal was greatly raised—53° C. The animal's fur temperature, taken by stroking the fur to and fro with a thermometer, was a good guide to the intensity of the sun. For this purpose we also recorded the temperature of a piece of ordinary black fur exposed to the sun until its

temperature became almost constant. Table II. shows how the temperature of the animal continues to rise after death; the cause of death in this case was probably due to urethane. Tables IIIA and IIIB should be compared with one another. The results in Table IIIA were obtained from a grey rabbit, the whole body being exposed to the sun, whereas the results in Table IIIB were obtained at the same time from another grey rabbit, the head and upper part of the body being exposed, while the rest of the animal was shaded. Whereas the temperatures of the various deeper tissues showed a distinct rise of temperature in the former rabbit, in the latter there was distinct fall. In the former rabbit the respiration was much increased, being 108 per minute, whilst in the latter quite a normal figure was obtained, 60 per minute.

We may conclude, then, that exposure of the head and upper part of the animal to the sun probably caused on the whole a depression of metabolism. We must remember that the rabbit has no sweat glands. It is well known that this animal does lose heat easily from its ears, but such a mechanism obviously could be of little value when the fur temperature of the head was 46° C. in the sun. As we were not able to produce much local effect on the brain by the intensity of sun available—the fur temperature never exceeded 54° C.—we next employed the carbon arc, placing the animal head-on about 4 or 5 feet from the carbon arc reflector, the body of the animal being shaded. Tables IV., V., VI., and VII. give results from some observations. It will be noted that we obtained a distinct rise of temperature in the brain by the rays from the carbon arc when the fur of the head was heated above 60° C. Thus in Table IV., after 30 minutes' exposure, the temperature of the fur of the head was 61° C., the temperature between the skull and dura mater was 41·5° C., that of the cerebrum was 41° C., whilst the rectal temperature was only 38·5° C. The effect of heating of the head and brain by this means caused a marked increase in rate of respiration, although the rectal temperature was not increased. Subsequent shading of the whole body of the animal was followed by a fall of temperature of the urethanised animal below normal—which is usually given as 38·5° C. for an ordinary laboratory rabbit. In Table V. it will be noted that exposure to the carbon arc produced the following readings: 69° C. for the fur of the head, 46° C. under the scalp, 43° C. between the skull and dura mater, 42° C. in the cerebrum, 40·5° C. in the medulla, whilst the rectal temperature, although showing an increase, was quite a normal figure, 38·5° C. Here, again, the respiration was much increased. In Tables VI. and VII. we give the results obtained from animals without an anæsthetic. They are very similar to the results during anæsthesia given in Tables IV. and V. The figures in Table VI. were 69° C. for the fur of the head, 42·5° C. for the cerebrum, taken immediately after killing the animal by a blow on the neck, 41·5° C. for the medulla, whilst the rectal temperature was 41° C.; and the figures in Table VII. were 67° C. for the fur of the head, 42° C. under the scalp, 40° C. in the cerebrum, and 38·5° C. in the rectum.

Our results are of interest in connexion with the pathological effects of insolation, as in sunstroke. This subject was dealt with by one of us (L. H.) in "The Science of Ventilation and Open-Air Treatment,"[4] to which the reader is referred for the literature. Therein it is recorded that Aron killed monkeys by exposing them to the sun in the Philippines. They died with body temperatures reaching respectively 43·5°, 42·7°, 46·3°, and 44·8° C. None of our rabbits showed a higher rectal temperature than 42° C. Aron found that shading by an umbrella or a board prevented death, as did a brisk current from a fan. Death was due, then, to heat-stroke, and not to any lethal effect of light rays, a conclusion confirmed by the fact that monkeys enclosed in boxes, with the head only exposed, suffered no inconvenience, although their scalp temperatures reached 47° C. One of our rabbits showed 48° C. for temperature of subcutaneous tissue of the neck when exposed to the carbon arc (Table IV.); another rabbit gave 46° C. under the scalp when similarly exposed (Table V.). None of our animals died during exposure.

Schilling[5] also found the subcutaneous temperature of a white rabbit in the shade to be 38·4° C.: in the sun in 30 minutes it rose to 40·4° C. The skin was shaved, and after 30 minutes in the sun the temperature of the subcutaneous tissue was 41·5° C. Our figures for subcutaneous tissue temperatures were often higher than these, although our animals were not shaved. Schmidt [6] exposed a white and a black rabbit to the sun. The rectal temperature rose from 38·5° to 39·5° C. in the white, and to 40·2° C. in the black, so that attention must be given to the fact that black fur absorbs more heat than white fur.

Three chimpanzees were exposed to full sun by accident in a court of a laboratory in French Guinea mid-day, between 12 to 2 o'clock. The temperature of the air was 40·6° C., the relative humidity 20. The servants reported that they had noticed the agitation and plaintive cries of the animals. They were found as convulsions passed into muscular resolution, coma, and death. The conjunctivæ and skin were injected; there was no relaxation of sphincters; the pulse was accelerated and the animals died in spite of cold baths. The rectal temperature was 40° C. 15 minutes after death. Post-mortem examination revealed congestion of all organs, particularly the lungs, turgescence of venous sinuses of the brain, and presence of exudation in the pericardial cavity. There were signs of a destruction of leucocytes in the blood.[7]

Our results support the evidence that while so-called sunstroke is generally heat-stroke due to overheating of the body in general, overheating of one part of the body can be brought about by the sun or other source of radiant energy. Pith helmets, spinal pads, &c., prevent such local heating, which takes place to a greater extent in those exposed to the sun whose circulation is from any cause enfeebled. The perfectly fit man, just as the fit monkey, can become inured by training and suitable diet even to exposure of his whole body to the tropical sun, protected as he is by sweating and a good circulation.

Results from Observations upon Human Skin.

We have repeated, under somewhat varied conditions, Sonne's experiments, which deal with the power of luminous rays to heat up subcutaneous tissue and the blood therein above the surface temperature. For these observations we employed ordinary sources of rays—that is, the rays from a carbon arc lamp, red radiant heat from an ordinary gas radiator, and dark heat rays from the same source, the luminous rays being shut out by placing an iron sheet in front of the gas fire. Obviously the carbon arc possessed the most luminous and the dark heat the least luminous rays. The non-luminosity of the rays was tested by tube inspection under a dark cover. The thermo-electric needles of the differential galvanometer were placed under the skin and just below each knee, and one knee was exposed to the various rays, the other being shaded. When in each case the surface temperature had reached the just bearable temperature of 45° C.—as measured by a delicate surface thermometer—the reading of the differential galvanometer was taken. The differences between the temperatures under the skin of the two knees (L. H. June 27th, 1922) were 10·5° C., 6·7° C., and 6·3° C. for the carbon arc, ordinary gas fire and dark heat rays respectively, showing that the more luminous rays from the carbon arc affected the subcutaneous temperature to a greater degree than did the rays from the other two sources of heat. This supports Sonne's work, showing that luminous rays raise the subcutaneous temperature above that for the skin surface. It was found in our experiment just described that the temperature under the shaded knee was 33·5° C.—one needle was placed in water of a known temperature, and thus the differential galvanometer enabled us to calculate the exact temperature under the shaded knee where the other needle was placed. From this

it follows that the exact temperatures under the skin of the exposed knee were 44° C. (33·5+10·5) with the carbon arc, 40·2° C. (33·5+6·7) with the gas fire, and 39·8° C. (33·5+6·3) with the dark heat rays. Experiments with other subjects gave similar results. Thus with subject J. A. C. (June 29th, 1922), when the skin of the exposed knee showed a surface temperature of 45° C., the temperatures under the skin were 12°, 10°, and 9° C. higher for the exposed knee than for the shaded knee with the carbon arc, gas fire, and dark heat rays respectively.

In other experiments we employed an insulated and coiled thermometer placed over the median vein in front of the elbow, whilst the hand was exposed to the rays from the same three sources. The temperature rose rapidly over the vein with any of the rays, showing that the blood in the hand was warmed by the rays. It was not possible by this method to show the comparative effects of the rays from the different sources, because the hand was also heated by the air, and this would affect the temperature of the blood in the median vein, although such a condition could not greatly influence the results with the hypodermic needles, as they were localised. We also found that when the forearm is exposed to the Alpine winter sun and to the cold atmosphere that the surface temperature of the median vein may rise 2–3° C. in five minutes.

Summary.

1. Exposure of the whole body of a rabbit to the sun's rays at Hampstead rapidly increased the temperature of the deeper tissues, the fur temperature rising as high as 54° C.

2. Exposure of the head and upper part of the body to the sun's rays was followed by a fall of temperature in the deeper tissues, the fur temperature in the sun not exceeding 46·5° C.

3. Local exposure of the head of a rabbit to the carbon arc greatly increased the temperature under the scalp and in the brain, the fur temperature rising above 60° C. The body temperature—rectum—was often not greatly altered. The respiration was always very rapid—over 100 per minute.

4. While recognising fully that heat-stroke is usually due to a general raising of the body temperature, our results show that local heating may occur, and confirm the utility of pith helmets and spinal pads on exposure to tropical sun.

5. Using the skin of the human knee and ordinary sources of rays—carbon arc and gas radiators—Sonne's results were confirmed—i.e., luminous rays heat up the subcutaneous tissues to a greater degree than do non-luminous rays, the skin temperature being the same in both cases.

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THE TREATMENT OF STUTTERING.

BY E. W. SCRIPTURE, M.D. MUNICH, M.R.C.S.ENG.,
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STUTTERING or stammering is usually regarded as incurable, and not more than 5 per cent. of treated cases ever fully recover, for the pathology of the disease has never been established, and no rational methods of treatment have been found.

The Pathological Lesion.

The first step is to locate and define the pathological lesion. For years I have been attempting this by means of speech inscriptions. In this method of research the patient speaks into a recording apparatus that registers the puffs and vibrations of speech on the moving surface of a blackened drum. The record sheet is afterwards removed and studied, and measured under the microscope.[1] The detailed results of the investigations lead to certain conclusions.

In the first place the speech inscriptions show that stuttering does not involve any lesion or abnormality of the organs of speech as part of its pathology. Most important of all is the proof that stuttering does not depend on any lesion of the nerves, of the bulbar centres, of the mechanisms of taxia or synergia, or of any form of nervous coördination. The theory of Kusmaul, Gutzmann, and others, that stuttering is a trouble of nervous coördination of the muscles, has no foundation, and the theories that it depends on defective breathing or tongue action are contrary to fact. In the inscriptions of stutterers there is one peculiarity that is never lacking, even in the speech of a patient when he is apparently not stuttering. The stutterer shows a special type of the melody of speech. No such form of the melody of speech is found in any nerve or brain disease or in any mental disease, even of the milder types such as hysteria, psychasthenia, or early dementia præcox. It has, however, two resemblances, on the one side to the speech of normal persons in a certain condition of mind, and on the other side to the speech of epileptics. As I have shown in studies of the speech of epileptics,[2] the condition common in these three cases is an emotional resistance to the situation, a negation of yielding to the environment. When the environment is changed so that the objectionable element is removed, the peculiarities in normal speech, epileptic speech, and stuttering disappear.

The vital point is next to determine the nature of the objectionable element that affects the speech. In normal life it is anything that arouses a feeling of opposition. With the epileptic it may be the entire content of life. The stutterer has no objection to the events of life, yet when he finds himself alone, his stuttering disappears. It is to be understood, of course, that the objection in all these cases is unconscious; the epileptic or the stutterer himself knows nothing about them and would deny the fact if it were told him. There may be the usual conscious over-compensation for the unconscious defect; the epileptic or the stutterer may attempt to be even more sociable than normal.

Necessary Alteration of the Mental Condition.

If stuttering is a resistance to the human element in the environment, its location is mental, and the aim of the treatment should be to alter the mental condition. Consider the following emergency: A very bad stutterer is called upon to deliver a public lecture before an august body, and on account of his trouble his address will have to be read by someone else. In such a case the stuttering can be temporarily cured for a few days by making a slight but somewhat painful cut in the tongue, by burning it slightly with a cigarette end, by holding a sharp pebble in his mouth, or by any other device that will make his tongue feel painfully queer. The explanation is a curious one. He is now a person in pain, and the human environment may go hang. Another emergency is that of the stutterer who cannot or will not undergo rational treatment but wishes to have occasional help in important situations. If he has sufficient force of character to be willing to speak in what he considers a queer voice, he can speak fluently whenever he pleases. The explanation is that he now feels himself to be a personality of a different kind. This phenomenon is illustrated by the following case: The head of a large business department stuttered so that he could not dictate to his stenographer; he always wrote out his letters and then handed them to her. This he kept carefully concealed from his superiors. On beginning treatment he was told to sing; he had no ear whatever and simply spoke along on about one tone in practically normal speech

[1] The method has been repeatedly described in Brain, Quart. Jour. of Med., Proc. Roy. Soc. Med., Jour. of Neurol. and Psychopath., and also in my Stuttering and Lisping.

[2] Proc. Roy. Soc. Med., 1920, vol. xiii. (Psychiatry), p. 18.

although he believed he was singing. He was now told simply to sing his letters to the stenographer and that all would be well. He refused, saying that he did not wish to make a fool of himself by singing to his stenographer. The result was "no thoroughfare." It could not be explained to him that he did not really sing when he thought he was doing so, for the entire efficacy of the method lay in his *belief* that he was singing.

Abnormal Melody of the Stutterer's Voice.

The situation can be helped by demonstrating to the stutterer that he always—even when not stumbling—speaks with an abnormal melody that seems natural to him, but that is really abnormal. Then he is shown that he can speak perfectly in any abnormal way—e.g., in a dialect, with long vowels, on a high note, &c. Finally he is shown that he can also speak perfectly when he adopts a melodious manner of speaking. He will object that when he speaks so melodiously he speaks queerly. It must then be shown to him that when other people speak melodiously the speech does not sound queer. He must grasp the fact that his own abnormal speech appears normal to him but abnormal to others, and that although melodious speech sounds abnormal to him, it sounds normal to others. If he can do this, and has character enough to carry out instructions, he can speak perfectly whenever he wishes. Any rational cure must be aimed at correcting the fundamental psychic defect.

The Combating of Fear.

First, the stutterer's opposition is to be combated, but to tell the patient about his attitude of opposition or of the need of changing it is absolutely contra-indicated. His opposition is unconscious and unknown to him and he will disbelieve and resent any such statement. The chief cause of opposition is the feeling of fear, which can be combated in several ways.

An obvious method of combating the fear is to readjust the patient's environment. In nearly all cases of stuttering children some disturbing influence will be found in the family circle; one boy stood in dread of a vigorous and domineering father, and trembled whenever the father spoke. A school away from home was advised. Many a boy is so coddled, so dependent on his mother, that no result can be hoped for until he is removed from her. The influences in a child's life can be fully understood only by persons familiar with the psychology of the unconscious.

A second method is to get at the root of the fear by psycho-analysis. This alone is not adequate, and no stutterer has ever been cured by it. The patient has a whole series of bad habits engrafted upon his fear, and he will not drop them unless he is shown how to do so. The usual methods of psycho-analysis can often be most profitably modified with stutterers. It is to be remembered that the stutterer comes for relief from his speech trouble, not for the readjustment of his nervous condition. Many such patients resent the slightest discussion of sex topics. If it were necessary to perform an elaborate psycho-analysis in order to cure stuttering, the difficulty would have to be faced, and the patient would have to submit or go away, but this is fortunately not the case. Two of my patients, a boy and a girl, found relief by merely talking about family affairs. Sexual matters were never mentioned, the chief weight being laid on other methods.

Still another method lies in exercises that will combat fear in general and fear in speaking in particular. Such forms of outdoor sports and gymnastic exercises are to be selected as will, in the particular person, best produce a feeling of power and superiority. A similar feeling in meeting an opponent may be favoured by boxing and fencing. Breathing exercises often help to give confidence in speaking. Of the utmost importance are exercises in melodious speech, in rhythm, in expression, and so on. The exercises in themselves are worthless; it is the specialist's use of them to develop confidence that is the active principle. The administration of glandular substance from the suprarenal cortex has been favourable in examples of timidity, but the best success is attained when it is combined with thyroid and pituitary.

The Stutterer in a Speech Clinic.

The case of a stutterer in a speech clinic or a special school class is not so hopeless as it might appear, but to treat a whole class by one form of exercise is like treating a surgery full of people from one supply-bottle. Again, to submit a whole class to many exercises is no more rational than to dose the whole surgery with all the medicines of the dispensary indiscriminately. The variety of the effect does not counteract the patient's confusion and loss of confidence. A class or a speech clinic should be handled exactly like a crowded surgery. Each patient should be seen separately every time, and should receive a prescription for the particular exercises or other treatment that he may need at the time. The exercises themselves can be carried out by proper assistants. The head of a speech clinic is necessarily a physician; no layman can conduct it, any more than a nurse can run an orthopædic clinic. The treatment of stuttering is a medical affair and can be handled only by a medical man.

Clinical and Laboratory Notes.

CASE OF INVERTED PYLORUS OBSTRUCTING A GASTRO-JEJUNOSTOMY APERTURE.

BY JAMES MCCLURE, F.R.C.S. ENG.,
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A SEARCH in the literature has failed to reveal a report of any case similar to that described below, and as it illustrates a danger to be avoided, we think that it may not be without interest to those engaged in the practice of gastric surgery.

Post-mortem examination of a woman, aged 22, revealed the following remarkable condition: The pylorus had evidently been divided surgically at a previous date, and a posterior gastro-jejunostomy had been performed. There was an interval of about 2 in. between the pyloric end of the stomach and the duodenum, and in this interval the liver was adherent to the pancreas. On separating the adhesions the pancreas came into view. The proximal and distal ends of the divided pylorus had been invaginated, but whether any portion had been removed it was impossible to determine. On opening the stomach along the lesser curvature, the invaginated portion of the pylorus was seen to be about 1½ in. in length, hanging down in the form of a pedunculated polyp into the gastro-jejunal aperture, and almost but not quite blocking it (see diagram). No ulcer was found in any part of the stomach or jejunum. The polyp was freely movable and was neither swollen nor œdematous, but it is conceivable that during life congestion of the polyp with some spasm of the gastro-jejunal stoma had from time to time occurred, producing intermittent obstruction of the orifice. Congestion might also have led to hæmatemesis, and thus it is possible to explain the puzzling symptoms presented by the patient before her death. She was admitted to hospital 13 days before she died with a history of gastric trouble of eight years' duration—i.e., commencing at the age of 14. Two operations had been performed, in May, 1918, and in June, 1922, respectively but with temporary relief only, persistent epigastric pain accompanied by vomiting and hæmatemesis making her life one of misery and incapacity. She had never been able to undertake any serious work and had spent long periods ranging from 7 weeks to 14 months in bed on a milk diet. Even after admission to hospital, when all food by the mouth had been stopped,

Diagram showing anatomical relationships of the inverted pylorus.

she continued to vomit. Life was maintained for some days by means of rectal salines and glucose, but her condition was too precarious to permit of further surgical intervention.

The case is reported to illustrate the danger of invaginating too long a portion of gut and thereby forming a polyp. In this case it caused an obstruction to the outlet from the stomach, and it is possible that in other situations—for example, in a lateral anastomosis after resection of intestine—a terminal invaginated portion might similarly be a potential source of obstruction.

CASE OF TORSION OF AN OVARIAN CYST IN AN INFANT.

BY E. M. POWELL, M.R.C.S. ENG.,
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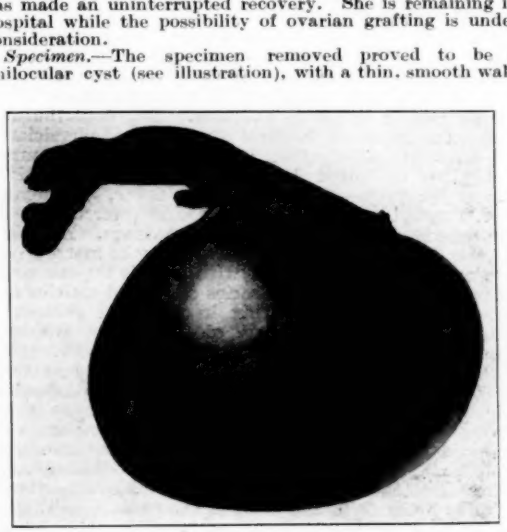
THE following case may be of interest as an example of an unusual condition occurring at an early age.

A female infant, aged 5 months, was admitted to the Evelina Hospital for Children with the following history. Fourteen days before admission she had an attack of vomiting and abdominal pain, which passed off in 24 hours; four days before admission she vomited a quantity of dark brown material and refused to take the breast. She seemed to be in great pain, and was very constipated.

Condition on Examination.—When first seen at hospital the child looked extremely ill. She had a rectal temperature of 101° F. The abdomen was much distended, and per rectum there was blood on the examining finger. Resistance was felt above and in front of the rectum. On re-examination under an anæsthetic a tense, cystic tumour was found, about the size of the fœtal head, filling the abdomen and part of the pelvis.

Operation.—A laparotomy was performed, and the cyst was found to have a twisted pedicle; one twist included the right Fallopian tube, a second twist the uterus, with the left tube and ovary. The uterus and appendages were dark purple in colour, and had to be removed entire. The abdomen was closed without drainage. The patient's condition at the close of the operation was good, and she has made an uninterrupted recovery. She is remaining in hospital while the possibility of ovarian grafting is under consideration.

Specimen.—The specimen removed proved to be a unilocular cyst (see illustration), with a thin, smooth wall,



Ovarian cyst with twisted pedicle; one twist included the right Fallopian tube, the other included the uterus, left tube, and ovary. Note the two cysts (the size of peas) in the left ovary.

containing a serous brown fluid. It had apparently entirely replaced the right ovary. The left ovary also contained two cysts, the size of peas. The wall of the uterus was full of extravasated blood, and the organ had evidently been strangulated for some time. Microscopically, no trace of an epithelial lining could be found remaining in the cyst; there were several hæmorrhages into its walls from congested vessels.

I have to thank Mr. W. E. Tanner for his kindness in allowing me to publish this account.

Reviews and Notices of Books.

AN INDEX TO GENERAL PRACTICE.

By A. CAMPBELL STARK, M.B., B.S. Lond., L.S.A., Ph.C. London: Baillière, Tindall and Cox. 1923. Pp. 181. 5*s*.

Dr. Stark describes his book as a humble effort to help the general practitioner in his daily work. He comments on the curious fact that although a large majority of medical students go into general practice, no attempt is made during their curriculum to train them for their special work. Yet, he adds, the work of the general practitioner differs considerably from that of his teachers of medicine and surgery. Writing as a general practitioner himself, he frankly admits that some part of general practice must be a compromise between what it is best to do for the patient and what it is possible to do; and within the brief compass which he has allowed himself Dr. Stark sets out what he has himself found both good and possible in his own experience and after a considerable number of trials and errors. The book is dogmatic in the sense that it is largely a record of convictions deduced from experience. Dr. Stark takes a keen personal interest in his patients; he has learnt to understand and sympathise with their point of view; he evidently enjoys his work and finds satisfaction therein: his dogmatism is the mellowed expression of experience and as such will be welcome to the beginner in general practice. The book is arranged under a series of subject headings in alphabetical order, beginning with Alcoholism, Anæsthetics, Antiseptics, Babies, Birth Control, Blood Pressure, and Books. The section on Books is less than five pages long, but contains much sound advice. Dr. Stark deprecates the accusation brought against the general practitioner that he does not read, and he has drawn up a list of some dozen books which illustrate the principle that the most important things in general practice are personal observation and experience. The selection is felicitous and closely resembles what we have ourselves found useful. Chapters on medico-political and medico-ethical matters are as helpful as those dealing with technique. No embryo general practitioner can fail to derive some hints from the sections on Consultants, Fees, Panel Practice, Practice in Relation to the Law, the Patient and the Public. Nearly every section has its own brief bibliography with a suggestion for further reading. The book is sound and useful, and we congratulate the author upon it.

TECHNIK UND METHODIK DER BAKTERIOLOGIE UND SEROLOGIE.

Von Prof. Dr. M. KLIMMER, Obermedizinalrat, Direktor des hygienischen Instituts der Tieraertztl. Hochschule, Dresden. Berlin: Julius Springer. 1923. With 223 illustrations. Pp. 520. 11*s*. 8*d*.

THIS is a handbook of reference for laboratory workers and deals with the investigation of material from both human and veterinary sources. The methods described are concerned almost entirely with routine diagnosis and public health work, including the bacteriological examination of water and milk. Regulations and procedure required for taking, sending, and dealing with specimens and pathological samples are detailed, and there are good chapters on sterilisation, filtration, microscopy, staining, section cutting, and animal inoculation. There is a full account of the preparation of different kinds of culture media and of methods of cultivation. Twenty pages are occupied with the testing of disinfectants. The information about special micro-organisms is to be found in a convenient form as an alphabetical list occupying about 50 pages. A section or paragraph is devoted to each organism, and the chief criteria for their diagnosis; cross references are given to pages on which the methods involved are described. The commoner protozoa are briefly included with bacteria and spirochætes, a longer section being taken up with entamœbæ, but scarcely any mention is

made of helminths. There are some omissions—e.g., the *Micrococcus melitensis*.

The chapter on serology gives detailed methods for preparing diagnostic sera, but no reference is made to the manufacture of therapeutic sera. The techniques of agglutination and precipitin reactions are clearly described, as well as the various uses of complement fixation. The Sachs-Georgi and Meinicke reactions are shortly but clearly dealt with, and there are sections on the application of allergy, and anaphylaxis to the diagnosis of unknown proteins or bacterial substances, and infections. The tuberculin and mallein tests are very briefly treated, no doubt, because they belong to the department of the clinical rather than the laboratory worker.

No attempt is made to discuss scientific principles or current hypotheses. The limited scope of the book in this direction is indicated by the absence of all allusion to different types of meningococcus, pneumococcus, or proteus X19, &c., or to the Schick test for diphtheria immunity. The importance of bacterial carriers is alluded to only in the official regulations quoted, though the kind of laboratory for which the book is intended must be largely concerned with a search for carriers. On the whole the book appears to be a useful and accurate guide to ordinary technique and apparatus with a considerable choice of methods, but with little advice as to their relative advantages. A large number of references (as foot-notes) to original descriptions of method by German, American, English, and French writers considerably enhances its value.

MOLECULAR PHYSICS.

Third edition. By JAMES ARNOLD CROWTHER, M.A., Sc.D., F.Inst.P., University Lecturer in Radiology; Demonstrator in Experimental Physics at the Cavendish Laboratory, Cambridge. London: J. and A. Churchill. 1923. Pp. 189. 7*s*. 6*d*.

THE third edition of Dr. Crowther's book certainly fulfils the author's purpose of presenting in a coherent and intelligible fashion a brief account of the electrical theory of matter. The task is accomplished in a particularly attractive manner; there is always an attempt to visualise the processes which are being described. The author's impartiality serves him well; there are excellent accounts of the completest agreement with theory and fact, notably the variation of effective mass of the electron with its speed, the quantum relation of Planck and Bohr's recent "theory of action" in its application to spectroscopic phenomena, while difficulties are not shirked. Dr. Crowther has a way of taking the reader right up to the existing boundaries of knowledge and then letting him know how difficult it is in some places to reconcile the facts with the theories advanced to explain them.

The arrangement of the subject-matter is excellent, the diagrams are well chosen, and the style in which the whole book is written is happy. It is safe to predict that the third will not be the last edition.

X RAY DOSAGE IN TREATMENT AND RADIOGRAPHY.

By WILLIAM D. WITHERBEE, M.D., Radiotherapist, Presbyterian Hospital, New York; and JOHN REMER, M.D., Radiotherapist, New York Hospital. New York: The Macmillan Company. 1922. Pp. 87. 8*s*.

THE method of dosage described in this book has been used by the authors in clinics and private practice for the past four years. They regard the system of dosage "as safe within certain limitations—namely, between a 3- and 10-inch spark gap and between 6 and 20 inches distance." On the whole, this claim seems to be justified and the method is practical as far as a formula method can be. The system gets rather complicated with screened exposures, but no doubt this complication tends to simplify itself in the brain of the operator, though by that time his need of any rigid system may be less. Considerable stress is laid on the fact that the skin dose resulting from a number of exposures for the purposes of skiagraphy can be estimated by the formulæ given and the danger of accidents avoided. The authors claim no knowledge of the recent method of treating cancer by the use of high voltages.

The little volume is of the notebook type and as such is likely to be very useful.

THE NEW PSYCHOLOGY AND THE PARENT.

By H. CRICHTON MILLER, M.A., M.D., Editor "Functional Nerve Disease"; Hon. Director, Tavistock Clinic for Functional Nerve Cases. London: Jarrolds. 1923. Pp. 255. 6*s*.

THIS is a combination of advice to parents with the author's views on the new psychology—a useful term which allows writers to accept what of modern theories seems pleasing to them. In this case the new psychology is mainly that of Jung, with due acknowledgment of the work of Freud, and Dr. Crichton Miller makes this popular statement of principles because it seems to him worth while that psychologists should make good their attitude in the eyes of the intelligent and unprejudiced section of the public. With this aim it is perhaps justifiable to present his subject in a somewhat didactic manner and avoid many of its intricacies. But the simplicity thus attained is dangerous; the chapter on dream symbolism, for example, leaves the impression that interpretation of the dream is entirely a matter of ingenuity on the part of the analyst, and such a false impression should be avoided by the propagandist. The practical teaching of the book, however, is sound and useful; the theory of the unconscious has important application to the relationship between parent and child, and this application is intelligibly explained.

THERAPEUTIC LEXICON.

Lexikon der gesamten Therapie des praktischen Arztes, mit Einschluss der therapeutischen Technik. Second edition. Edited by WALTER MARLE (W. Guttmann). Berlin and Vienna: Urban and Schwarzenberg. 1923.

WE have received the third part, being pages 321 to 480, of this therapeutic lexicon, which aims at being a compendium of modern medical technique. The whole work is to be completed in 15 parts, which later can be bound in three volumes. The contributors include the names of the most distinguished physicians and surgeons in Central Europe. The scope may readily be indicated by citing a few consecutive subject headings—e.g., Glandular fever, Duodenal ulcer, Dupuytren's contraction, Thirst (increased and diminished), Douching, Douche-massage, Arteriosclerotic dysbasia, Dyshidrosis. It may be instructive to take one subject as dealt with in this lexicon and compare it with one of the series of special articles on Modern Technique appearing in our own columns. Take, for instance, epilepsy, on which Dr. Gordon Holmes wrote in THE LANCET of March 10th. Dr. Th. Becker finds it necessary to precede his account of treatment by a short section on differential diagnosis and the varieties of epileptic manifestations. It is curious that he should have to issue a warning against the popular practice (here only current amongst school-boys) of prising up the patient's thumb-nail during an attack in order to distract his attention. He gives bromide in the form of the sodium salt, the Sandow salt, or the Erlenmeyer mixture, combining it with a salt-limited diet, and for some time past has combined these two objects in his own practice by prescribing sedobrol (Roche), which is a combination in tablet form of bromide with soup extract. He first tests the patient's bromide tolerance by giving up to four to five tablets a day, gradually reducing to zero by omitting one tablet a day, dropping a week, and then slowly increasing again. He has succeeded in this way in freeing completely from their periodic attack a number of severe cases. Flechsig's opium-bromide treatment he regards as archaic, and he has had no success with Rosenberg's epileptol, for which high claims have been made. Of drugs, apart from

bromide, he mentions only zinc oxide and atropine, the latter in doses of 0·2 to 0·5 mg. Prophylaxis for threatened individuals Dr. Becker regards as of the first importance, the tendency to hereditary transmission being so strong that marriages of epileptics, if entered upon, should remain sterile. Total abstinence from alcohol, regular daily action of the bowels, and non-stimulating nourishment are the points on which he lays stress, as well as limitation of salt in the diet. A useful list of institutions for epileptics completes the article.

DISEASES OF THE LIVER.

Physiologie normale et pathologique du foie. By G. H. ROGER, Doyen de la Faculté de Médecine de Paris, Professeur de Pathologie Expérimentale et Comparée, Membre de l'Académie de Médecine. Paris: Masson et Cie. 1922. Pp. 400. Fr.22.

THIS book deserves a wide audience, and should be read with special interest by those who last year welcomed the learned Dean of the Medical Faculty of Paris when he addressed a London University audience. Prof. Roger writes with lucidity and understanding, and summarises our present-day knowledge of the physiology of the liver in health and disease. His book, also, forms a valuable treatise on the mechanism of the production of immunity, and is a fitting continuation of the work which its author began under the inspiration of Claude Bernard.

Traité de pathologie médicale et de thérapeutique appliquée. Vol. XII.: Foie et Pancreas. Second edition. By J. CASTAIGNE, BRULÉ, GARBAN, NOEL FIESSINGER, FAROY. Paris: A. Maloine et Fils. 1923. Pp. 522. Fr.22.

THIS volume is one of the most attractive yet published in this system of pathology and therapeutics. Prof. Castaigne deals clearly with the general problems of hepatic disorder and emphasises the importance of modern laboratory methods. Prof. Noel Fiessinger sets out the clinical facts with regard to the cirrhoses and treats of their general pathological effects in a manner which is original and suggestive. Other subjects, such as gall-stones and hepatic abscess, contain excellent epitomes of the doctrines of the French School of Medicine. The portion of the book which deals with the pancreas is less attractive; little mention is made of the connexion of the pancreas with diabetes, and when it is said that no reference is made to the work of Allen, of Opie, or of Banting and Macleod, the significance of the omission will be understood.

A DICTIONARY OF APPLIED CHEMISTRY.

Vol. IV. By Sir EDWARD THORPE, C.B., LL.D., F.R.S. London: Longmans, Green and Co. 1922. Pp. 740. 60*s*.

THE fourth volume of this well-known and important work, which starts at "L" and concludes with "Oxydisilin," well maintains the high standard of the previous volumes. The contents of the dictionary have been carefully revised so as to accord with recent developments of chemical science. Many new articles have been added, and certain of the existing articles have been re-cast or re-written. Fine chemicals have been the subject of special attention, the pharmacological articles have been revised, alkaloids and synthetic drugs have been treated at greater length, and a considerable amount of new matter relating to them has been added.

There is much which is of interest to the medical man in the present volume. Thus Dr. E. F. Armstrong writes on the enzymes, lactase, lipase, maltase, and the oxydases; Prof. G. Barger on laudanum, liquorice root, nicotine, and other alkaloids; Mr. C. T. Bennett on essential oils; Mr. J. Connah on liqueurs and cordials; Mr. Cribb on spices; Mr. C. A. Mitchell on oils, lard, and margarine; Mr. H. D. Richmond on milk; Mr. F. Scudder on meat extracts; and Dr. H. E. Watt on nux vomica and opium.

CHEMICAL REACTIONS AND THEIR EQUATIONS.

By I. W. D. HACKH, Ph.C., A.B., Professor of Biochemistry, College of Physicians and Surgeons of San Francisco. London: Chapman and Hall. 1922. Pp. 138. 6*s*.

THE difficulty which students have in fully appreciating chemical equations is well known to teachers of chemistry. The present volume has been written with the object of assisting a clearer understanding of the principles of chemistry so that the student should be enabled to balance any equation with care and rapidity. The subject-matter deals with symbols, formulæ, equations involving oxidation and reduction and the converse, reactions and their control, and types of chemical reactions and equations. The information presented is concise and free from errors.

LEHRBUCH UND ATLAS DER GASTROSKOPIE.

By Dr. med. RUDOLF SCHINDLER, Assistenzarzt der 2 med. Abteilung des Krankenhauses Munchen-Schwabing. Munchen: J. F. Lehmann. 1923. Pp. 132. 9*s*. 7*d*.

IN this book the author deals with the problems and possibilities of gastroscopy. Available types of instrument are described, and the technique of securing a complete examination of the internal surface of the stomach is fully gone into. The volume is illustrated by 20 coloured plates showing the appearances seen in gastritis, ulceration, malignant disease, and after gastro-enterostomy. It is impossible to read it without being deeply impressed by the possibilities of gastroscopy, and it is to be hoped that the subject will soon obtain wider notice in this country. The size, paper, and binding of this book are of a quality which makes the price demanded an exorbitant one; this is the more striking in view of the present rate of exchange with Germany.

A HANDBOOK OF NURSING.

Eighth edition. By M. N. OXFORD, formerly of Guy's Hospital. London: Methuen and Co., Ltd. 1923. Pp. 312. 6*s*.

Miss Oxford's Handbook of Nursing, which has reached its eighth edition, can be highly recommended to probationers in training. Young nurses may often be confused with the multiplicity and variety of new duties on entering hospital training, and this manual may help them considerably in understanding their work. Chapters which will be found specially useful are those on What to Observe in Nursing, Infectious Diseases, Monthly Nursing, and X Rays. The value of the short chapters on Anatomy and Physiology would have been enhanced by the addition of some clear illustrations. Miss Oxford's aim to supply in as simple a form as possible the knowledge essential for the comfort and care of the sick has undoubtedly succeeded, and the book should inculcate in young probationers the principles which underlie all good nursing.

OXIDATIONS AND REDUCTIONS IN THE ANIMAL BODY.

Second edition. By H. D. DAKIN, D.Sc., F.I.C., F.R.S. London: Longmans, Green and Co. 1922. Pp. 176. 6*s*.

Dr. Dakin clearly states the object of this monograph in one of the opening sentences of the introduction, where he says, "The statements that fats and carbohydrates are oxidised to carbon dioxide and water are no longer considered all-sufficient explanations of the chemical rôle of these substances in the animal economy." Unfortunately, this statement is only too common both among teachers and students. Metabolism has been studied and taught far too much from the anabolic standpoint. Thus, after an amino-acid has been de-aminised we lose all interest in it, dismissing it with the statement that carbon dioxide and water are the end-products. To show the complexity of oxidising reactions in general the author takes the apparently simple case of the burning of carbon

monoxide in air. That the reaction does not proceed according to the well-known equation $2CO+O_2=2CO_2$ is proved by the fact that water is an essential participant in the reaction. Furthermore, various observers have isolated formic acid and hydrogen peroxide as by-products. That such an apparently simple reaction should prove so complicated makes the physiologist and biochemist wonder what stages are passed through when fats and carbohydrates are oxidised. Dr. Dakin takes each group of food substances, as well as various bodies of biological importance, and traces the changes undergone by them in the body.

This volume, small as it is, forms a valuable addition to the series of monographs on biochemistry and will open up an entirely new field for many readers.

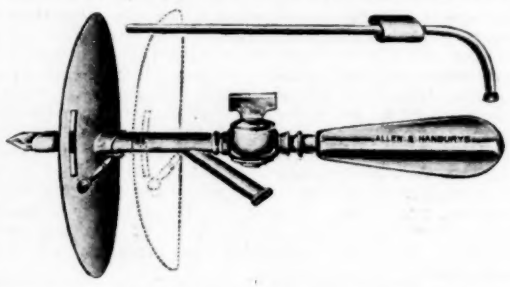
JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. April, 1923.—Robert Muir (Glasgow): Obituary Notice of James Ritchie, Professor of Bacteriology in the University of Edinburgh, Secretary of the Society, 1906–1921, and Editor of the Journal 1921–23.—S. P. Bedson (London): The Genesis of the Mammalian Blood Platelet. Studying the regeneration of platelets after the administration of a lytic serum, the author concludes that they do not arise from red corpuscles or leucocytes, but are an independent element, originally nucleated like the thrombocytes of birds but losing their nuclei at maturity, as do red cells. In another paper on immunity to antiplatelet serum the same author shows that this is not due to the development of an anti-antibody, the existence of which becomes more and more doubtful.—T. Toda (London): An Attempt to Group Human Platelets with Red-cell Grouping Sera. Results altogether negative.—J. Ségal (London): A Fungus Isolated from Guinea-pigs Inoculated with the Virus of Typhus Fever. The fungus and virus show a remarkable association in passage through a series of animals.—S. C. Dyke (London): The Passage of *Staphylococcus aureus* through the Kidney of the Rabbit. The organisms pass into the urine only when they have definitely damaged the kidney.—W. E. de Korte (Cape Town): A Paramycetoma (?) of the Forearm. A subcutaneous nodule developing after a slight injury showed marked overgrowth of epithelium and what is apparently a filamentous fungus.—E. M. Dunlop (Glasgow): The Wassermann Reaction in Scarlet Fever. There is no evidence that scarlet fever ever causes a positive reaction.—R. P. Smith (Glasgow): The Relationship of the Autolysin and the Wassermann Antibody in the Serum of a Paroxysmal Hæmoglobinuric. The two properties of the serum are distinct.—E. M. Luce (London): The Size of the Parathyroids of Rats and the Effect of a Diet Deficiency of Calcium. Rats fed on a diet deficient in calcium show a consistent hyperplasic enlargement of the parathyroids.—V. Korenchevsky (London): The Influence of Removal of Sexual Glands on the Skeleton of Animals Kept on Normal or Rickets-producing Diets. Castration has no effect on bone-growth in rats.—The same author describes an outbreak of spontaneous rickets among laboratory stock rats due to careless feeding; bacteriological investigations lent no support to Morpurgo's infectious hypothesis.—S. R. Gloyne and D. S. Page (London): The Reaction to *B. tuberculosis* in the Albino Rat. Rats are naturally highly resistant to tuberculosis, though after injection the bacilli are absorbed and spread in the body much as they do in the susceptible guinea-pig; virulent organisms may be recovered from the tissues after several months. Rat serum has no special bactericidal properties, though phagocytosis is extremely efficient.—J. M. H. Campbell, G. H. Hunt, and E. P. Poulton (London): An Examination of the Blood Gases and Respiration in Disease, with reference to the Cause of Breathlessness and Cyanosis. The authors have made an extensive investigation of cases of heart disease, anæmia, polycythæmia, primary functional deficiency of the lung and cardio-renal disease, correlating the laboratory findings with the clinical condition. The value of the work lies mostly in details, for which the original must be consulted. Generally the authors conclude that peripheral venous stasis is nearly always a factor in cyanosis as well as deficient arterial oxygenation, and that bronchial spasm is the most potent cause of breathlessness.—F. G. Macnaughton (St. Andrews): A Simple Emergency Medium for the Primary Growth of the Gonococcus. Blood clotted in ordinary broth.—L. Cobbett and D. Keilin (Cambridge): Mucoid Casts from the Vermiform Appendix. A curious case in which a large number of small spherical masses of mucin filled the appendix.—R. Donald (London): Rapid Histological Sections, Gelatin Embedded and Fixed Throughout the Preparing: Diathermy Excision of Diagnostic Pieces: A Simple Modification of Twort Staining: A Syrup-gelatin Mountant: A Slide Index Box.

New Inventions.

AN EMPYEMA TUBE.

I HAVE recently modified the empyema tube devised by W. Turner. The spear point of the trocar has been shortened: the innermost opening of the cannula has been retained and enlarged, and the two other lateral openings have been dispensed with, and the small oval sliding shield has been enlarged, its greatest diameter being now 3¾ inches, and reversed so that its concave surface now fits the convex chest wall. The additions are a tap fitted to the outer end of the cannula, to which a side-arm has been attached; and a small metal tube, with tapered plug to fit the tap. The tube allows of irrigation of the pleural cavity, either intermittent or continuous. These alterations are shown in the illustration. In use the



cannula is passed through a rubber disc, which is the shape of, and rather larger than, the shield. The rubber disc fits the cannula tightly and lies against the concave surface of the shield. Rubber tubing connects the side-arm with a suction apparatus, which is set working. The trocar and cannula are pushed into the chest through an intercostal space. The shield is clamped at a level permitting the cannula to project into the empyema cavity for not more than one inch. The trocar is withdrawn and the tap is shut at once to prevent any serious entry of air. The pus escapes, through the side arm, into the suction apparatus. The shield and rubber disc are fixed tightly to the chest with tapes and strapping. To irrigate the cavity, the outer end of the metal irrigating pipe is connected by rubber tubing with the reservoir of lotion. The tap of the cannula is opened and the irrigating tube is inserted into the cannula until its tapered end plugs the opening in the tap. The lotion drips or spurts according to the degree of pressure employed into the cavity. The mixture of pus and lotion is sucked through the side arm by the evacuating apparatus.

The instrument has been made for me by Messrs. Allen and Hanburys, Wigmore-street, London, W.

C. HAMILTON WHITEFORD, M.R.C.S.,
Plymouth. L.R.C.P. Lond.

THE LANCET.

LONDON: SATURDAY, APRIL 14, 1923.

ACCURACY IN DISPENSING.

AT the recent Guildhall Conference of bodies interested in National Health Insurance anxiety was expressed by representatives of approved societies lest panel patients were receiving drugs inferior in quality to those dispensed for private patients. We indicated at that time how little gravamen this charge has, inasmuch as the standard quality of each individual drug is necessarily that of the British Pharmacopœia. The discussion has since shifted from quality to quantity, and wide publicity has been given to certain evidence that dispensing lacks the necessary accuracy, with the result that insured persons do not get the quantity of the drug ordered. Dr. G. CLARK TROTTER, medical officer of health for Islington, pointed out in our columns that having occasion to test the dispensing of quite a simple prescription, he found that 6 out of 17 pharmacists fell short of accuracy, even when no account was taken of slight discrepancies. In a letter which we publish this week, Dr. J. P. WALKER, county medical officer of health for the Isle of Ely, gives further evidence of large discrepancy in the dispensing of a simple prescription containing glycerine and potassium iodide, the error running up to 20 per cent. or more, generally on the minus side. This, it should be added, was ten years ago, and the episode is noticed to indicate that a certain tolerance of irregularities may have been present for a long time. At the North London police-court recently a fine of 2 guineas was inflicted for supplying a bottle of physic deficient in sodium salicylate to the extent of 8·4 per cent., the pharmacist pleading in extenuation that the deficiency was small and that he was pressed for time. At the same court another pharmacist was charged with issuing a mixture deficient in potassium bromide to the extent of 27·1 per cent., the case being postponed for a further analysis. In other cases a prescribed ingredient was shown to be absent. At Salford a chemist was fined £3 for substituting a pill containing aloes and myrrh for aloes and iron, pleading a too casual glance at the prescription. At Hackney a pharmacist was fined 20*s.* and 10 guineas costs for selling a compound known in the London Insurance Pharmacopœia as Mist. Gent. Co., totally deficient in chloroform and hydrocyanic acid.

In regard to the Islington cases of defective dispensing the President of the Pharmaceutical Society of Great Britain wrote regretting that charges should have been brought publicly by a member of the medical profession against pharmacists, seeing therein an attempt to create antagonism between the medical and pharmaceutical professions. The Secretary of the Retail Pharmacists' Union also wrote to assure us that the general standard of accuracy in dispensing is satisfactory, and that the Union, through its Pharmaceutical Committee, is coöperating with the authorities in securing the highest possible standard for insurance prescriptions. We note that the Union has since issued a large displayed advertisement setting forth the high standard of training to which the pharmacist is subjected, and pointing out that among 30 million prescriptions dispensed last year by the 5700 chemists belonging to the Union, only 11 were the subject of prosecution for faultiness, four of the charges being withdrawn. We hasten to assure both these professional associations that we were no party to a general charge of inaccuracy against practising pharmacists. But we regard the evidence as conclusive that certain pharmacists have not dispensed certain prescriptions with the accuracy which may reasonably be required of them, and we have no doubt that the Ministry of Health has been wise to ask the assistance of local authorities in securing accurate dispensing, especially in view of the fact that the Pharmaceutical Society has no disciplinary power to prevent an incompetent or culpable pharmacist from practising. We agree that it is not possible, nor is it necessary, to insist upon a high degree of percentual accuracy for every ingredient. Medicine bottles as at present manufactured differ considerably in content, the graduation cannot be accurate to the second place of decimals, the patient does not measure the dose with any great precision, and there is a wide margin in most cases between the therapeutic and the toxic dose. But the dispensing chemist before he receives his title has acquired an extensive knowledge of chemistry, including quantitative and qualitative analysis, after having passed a matriculation examination or its near equivalent. He is well qualified to know the value of precision and where it is imperative to be precise. The human factor necessarily enters largely into dispensing, which, as we know, is not a particularly remunerative part of the pharmacist's business. Nevertheless all good pharmacists do attain a practicable and reasonable degree of accuracy.

In respect of what is reasonably practicable the report recently submitted to the Public Health Committee of the county borough of Salford by its public analyst, Mr. G. D. ELSDON, is of special interest at the present moment. Three years ago, after conferring with the local pharmaceutical association, a workable scheme was devised of checking the practice of pharmacists by analysis of test mixtures. The scheme is roughly this. A prescription bearing the name and address of a panel patient is submitted by an unknown messenger to a panel pharmacist. The messenger having received the medicine calls the inspector into the shop, when the sample is then and there divided into three parts, one being left with the vendor, the second being delivered to the public analyst, and the third kept for reference in case of dispute. It was agreed between pharmacist and local authority that the strength of prescriptions should not differ by more than 10 per cent. from the truth, except in cases such as sodium bicarbonate, where a little more licence might be allowed, no hard-and-fast rule being laid down to cover every case. As a result of these analyses, the considerable laxity in dispensing at first found has shown great improvement; last year the proportion of gross error was only 5 per cent., compared with an average of over 20 per cent. in the years 1914 to 1918. Mr. ELSDON attributes this success to the friendly spirit which has existed among all the parties concerned. Pharmacists who were merely careless have become more careful, whilst the few who were really unfitted for their task by temperament or training are dropping out or are being removed from the panel. This result has been obtained without setting up an impossible standard and without harassing the pharmacist by administrative detail. It has been achieved without legal prosecutions or public scandal. Mr. ELSDON believes, and we agree with him, that a reasonable

scheme of checking combined with friendly coöperation between municipal officers and pharmacists would raise the standard of dispensing in other parts of the country to that now obtaining in Salford. There is no divergence of interest in the matter; pharmacists and doctors are alike concerned.

CRIME AND PUNISHMENT.

LAST week we dealt with insanity in relation to the criminal law, a problem recently brought into considerable prominence, and still waiting solution. But this question is only a part of the larger subject, crime and punishment, in which many thinking people are keenly interested. The number of books on prisons or prison reform published during the last year, the articles which recently appeared in the *Manchester Guardian*, and the public meetings to hear lectures or discussions, leave no doubt on this point. But just as in the matter of responsibility in relation to mental disease it is the lawyers and not the doctors who are the primary advocates of change, so in the larger problem it is doubtful whether the medical profession is taking the lead in insisting on more rational methods. It is true that two of the most important new books on crime have been written by Dr. M. HAMBLIN SMITH and Dr. MARY GORDON respectively, but the number of medical workers in this field is very limited. The meetings described are not usually organised or attended by medical practitioners, while the magistrates and others present sometimes complain of the lack of interest or understanding in their medical officer, or deplore the fact that no one is competent in their district to act as medical adviser to the Bench. It is idle to pretend that any qualified medical practitioner can do this; the student has no training in mental defect; his experience of insanity is insufficient to diagnose an incipient or difficult case, while psychology is practically a closed book.

How many medical practitioners, if asked, have any definite ideas or up-to-date knowledge as to whether treatment or punishment is the more hopeful method of dealing with crime? How many know what type of case is amenable to special treatment, still less what that treatment should be, or can say which are the unexplored fields most urgently demanding investigation? One of the correspondents to the above-mentioned newspaper stated that it would be greatly to the public advantage that 1000 consecutive unselected cases before the courts in Birmingham should be specially examined to determine what proportion of cases required such investigation, and incidentally to show how those requiring investigation could best be selected. Had this suggestion been made in regard to any other city than Birmingham or Bradford, always excepting London, would there be local psychological experts available? Such considerations led us to welcome the announcement in our advertisement columns of March 24th that a post-graduate medical course in crime and punishment would be again held at the Birmingham University in May. Although a fortnight's course is insufficient for training, it may be invaluable as a start to show the lines on which further experience should be sought. Those who would like to attend such a course, but hesitate under the impression that the systematic examination of delinquents is unlikely to become a matter of practical politics except in the remote future, would do well to note some of the circumstances that have led many to a fresh outlook on crime and prison life, and to consider how far they may be permanent. In the first place, the prison experiences in recent years of a large number of educated and refined persons of both sexes, as conscientious objectors or suffragettes, have done much to enlighten public opinion. Many of these persons, no doubt, have recognised that prisons were not designed for such as they, and also that prisons may not affect ordinary delinquents in just the same way. Still, and at last, many realise that there are few on whom prison can be expected to have a good influence. Secondly, the advent of women into public life, and particularly their presence on the justices' bench, favours a new point of view. Feminine intuition has been quick to see that all is not well, and that radical changes are necessary. When those with such ideas look at the records available they find their worst suspicions confirmed; they learn that the majority of serious offenders have been convicted not once, but many times previously, and that nearly all habitual offenders begin their delinquent career at an early age. Lastly, but not least important, is the knowledge that where only doubt and uncertainty existed before, the new psychology has shed much light. Psychology is ultimately the science of human conduct. There is still much that is controversial, but one fact has been established—namely, that conduct is invariably the result of mental life; and all the causes which have been given as explanations of criminality are only operable in so far as they affect the offenders' mental life. This is the theme of Dr. HAMBLIN SMITH in his article in the last number of the *Howard Journal*, and more fully elaborated in his book "The Psychology of the Criminal." His ideas are confirmed in the January number of the *British Journal of Medical Psychology*, by Mr. CYRIL BURT, who shows that delinquency in the young is assignable to a number of factors, and that "psychological factors, whether due to heredity or environment, are supreme both in number and strength over all the rest." Dr. MARY GORDON insistently demands a psychological examination of offenders, while the plaint of less technical investigators is not that the handling of prisoners is unkind, but that it is non-understanding. Those who have studied the subject know that the proper examination of an offender is no light task. Mental defect and insanity must be excluded; a thorough physical examination is necessary, and in addition a searching psychological investigation.

The Birmingham scheme, for the recognition of those who in consequence of mental defect or other reason require treatment and not punishment, makes such an examination possible, alike for those remanded to prison or not in custody, when the justices consider it necessary. The annual reports show that of more than 450 cases remanded in prison for special examination less than 24 per cent. were subsequently sentenced to imprisonment, while of the smaller number remanded not in custody none were sent to prison, nearly all being placed under treatment rather than punished in any way. Such records prove the economy of the arrangement. They indicate that a larger number might be examined with advantage, particularly of less serious cases, many of whom will otherwise be serious cases at a later stage. Many of those placed on probation should be studied first and suitable conditions enacted in the order. The recommendation of some workers that delinquents should be studied not only in the courts and in prison, but also in the school or general psychological clinics, before they come under notice of the police at all, opens up other fields to the trained medical psychologist, who will not fail to realise that his work cannot be undertaken by the ordinary probation officer.

PAINTING AND LEAD POISONING.

THE story of the white lead controversy is a long one. It started in France, dating back over a hundred years to the time when, with the rise of modern industrialism, the custom was adopted of protecting surfaces with paint; in this country the plaster-front period of the Regency gave an impetus to the new fashion. Forthwith sprang up vested interests in the manufacture of the materials used and also complaints from the painters of sickness and deaths resulting therefrom. Meantime attention was diverted to lead poisoning occurring among makers of the white lead used and among potters where the same substance was used as a constituent of glaze; and powers were taken and enforced in this country under the Factory Acts for the protection of those employed. Investigation disclosed that lead poisoning resulted mainly from inhaling lead dust, and action taken to prevent such inhalation was followed by a splendid reduction of cases. Then, in 1911, committees were appointed to consider the use of lead materials in paints employed on buildings and on coaches and carriages; these committees examined the position carefully for over three years before issuing their reports. By this time France, in 1909, had passed a law, to come into force in 1914, prohibiting the use of white lead in paints, but the war intervened; in Belgium, Switzerland, Austria, and Germany regulations, more or less stringent on paper, had been adopted. But the results of these regulations were far from satisfactory, since plumbism among painters had hardly been brought below what was prevailing in this country. The House Painting Committee concluded—and the Geneva Convention, on Nov. 19th, 1921, has since reinforced the decision—that the use of lead in paints for internal painting should be prohibited. They also recommended its prohibition for external painting, although the position here was more difficult since other paints were less satisfactory; yet to permit the use of lead paints outside and prohibit them within seemed bound to create confusion and endless opportunities for evading regulations of prohibition. Moreover, there was evidence that with a demand non-lead paints capable of resisting the weather would soon appear; already in one instance, notwithstanding the suspension of most research due to the war, the expectation seems to have been fulfilled, for the Office of Works, after four years' tests, informed the Home Office in 1919 that, for priming coats of iron and steel work, several kinds of leadless paints had given satisfactory results. These results have naturally been severely criticised by the advocates of lead materials in paints. But the Coach Painting Committee, on finding that such concerns as the Daimler Motor Car Company, the Midland Railway, and the Bradford City Tramways had abandoned the use of lead paints with entirely satisfactory results, decided that others could follow these examples, and recommended prohibition of lead paints.

Just before the Geneva Conference was due last autumn to consider the matter, the British Government tied its hands by appointing a new departmental committee, on which the working painter was not represented. Nevertheless, the Geneva Conference agreed to a convention prohibiting lead paints for the internal painting of buildings after 1927, and instituting stringent regulations for the use of lead paints where not prohibited. The duty of the new Committee was clearly altered by this decision, and became that of determining how best the Geneva Convention could be carried out. To this aspect they seem to have turned their attention; and now, after hearing 26 witnesses and meeting 13 times, they report.[1] They accept the Convention, but go even further in recommending the immediate prohibition of all dry rubbing down of painted surfaces. This process, on account of the dust generated, has long been accepted to be the main danger in the painting industry; but all practical witnesses before the 1911 committees stated that it could not be carried out damp. Recently, however, water-proof sandpaper has been introduced which permits damp rubbing down to be successfully adopted. The Committee then turn to the proposed regulations of the Convention for the house-painting trade, but can here see no hope of effective enforcement except through the goodwill and coöperation of the trade—i.e., except through inspection of the trade by the trade. When, however, the considered deliberations of the Committee are unhampered by the Convention, as in the matter of coach painting, they may be found to differ from the latter. Although as regards coach painting the Committee concluded that "there is a good deal more to be said for complete prohibition than in the case of house painting," and although what there was to be said was sufficient to lead them to accept prohibition for the internal painting of buildings, they "do not recommend prohibition" for coach-painting. Why?

INSTRUCTION IN MEDICAL PHYSICS.

WE publish in another column a letter from three of the examiners in physics for the triple qualification at Edinburgh, advocating the establishment in the medical curriculum of a definite course by a definite teacher of medical physics. We may anticipate at once the alternative views which the letter will produce. Some will be of the certain opinion that nothing in the nature of a further compulsory test should be added to the curriculum unless an equivalent in demand upon the student's time is subtracted. Others will suggest that the institution of such a compulsory course, if short and well-planned, though closed by a testing examination, would none the less assist rather than hinder the student, for comprehension of the principles of medical physics would bear fruit in most of the divisions of the medical curriculum. But all those who feel in this progressive way towards instruction in medical physics may not feel disposed to go so far as the letter from Dr. Alfred Daniell and his co-signatories, and undoubtedly the institution of another special examination would to-day be a confession of the failure of the existing course to meet its design. That design has been to examine the student at the beginning of his career in physics generally, leaving the special teachers in their turn to show him how the general information can be particularly applied. The demand for a definite course of medical physics at some later stage of the curriculum is a statement, in other words, that the teachers of the final subjects do not or cannot impart a knowledge of physics, in their medical application, so as to give the student a reason either for the pathological happenings which he is observing or the therapeutic technique which he is acquiring. Clearly honours physics cannot be taught to a medical student either before or during his curriculum; and if he is compelled to revise his knowledge at some point in the course the extent of that revision will always be a matter of dispute. The examiners in the final subjects could meet the situation, as it exists at present, by resolving to set in certain of the papers questions involving a knowledge of medical physics, but they would be loth to reject candidates whose inability to answer the questions might be due to absence of any facilities for acquiring the necessary knowledge.

[1] Report of Committee on Industrial Paints. H.M. Stationery Office. 1923. 2s. 6d.

Annotations.

"Ne quid nimis."

THE FUTURE OF MEDICAL BENEFIT.

IT has now been publicly announced that the Insurance Acts Committee of the British Medical Association is to meet the Ministry of Health on April 26th to discuss proposals in regard to the capitation fee for medical practice under the Insurance Acts. On May 12th the proposals of the Ministry and the opinion of the Insurance Acts Committee on these proposals will be circulated to the panel committees throughout the country; and on June 7th representatives of the panel committees are to meet, being fully instructed in the views and temper of their constituents. Dr. A. Cox reminded a meeting of practitioners a few days ago that this conference will not only be concerned with the amount of the capitation fee but also with the terms of service—that is to say, with the amount of professional time and effort which are to be given in exchange for payment. The position is not simply one of financial economy. When the Geddes Committee decided that the State purse was too impoverished to add its quota to that of employer and insured person in a national scheme of health insurance, the deficit was made up for the time being by accumulated funds at the disposal of approved societies; moneys, be it noted, which had been contributed by the three parties mentioned in excess of what was required at the time for medical and other benefits. Maybe the employer and the insured person consider that their present quota is sufficient. Maybe the National Exchequer is still unable to make its promised contribution. Nevertheless it is quite certain that a capitation fee must be paid which will obtain willing service from insurance practitioners, and it is also quite certain that some Government department must continue to control the incomings and outgoings under the Act. The Ministry of Health is in a position to assess the medical needs of insured persons and to allocate contributions equitably, and there is no doubt that the Ministry must remain as third party in any negotiations between the doctors and approved societies which these prefer not to arrange between themselves. As time goes on the duties of the chairman at this health conference, for this is what the position of the Ministry amounts to, will become less onerous. At the present time the chair remains. When settlement is reached insurance practice is entitled, in Dr. Cox's words, to a little blessed tranquillity, for no system on earth, least of all a complicated scheme of health insurance, can stand continual pulling up by the roots to see how it is getting on.

SCHOOL INTELLIGENCE AND HOME CONDITIONS.

THE question of the relative importance of heredity and environment in the upbringing of children is still unsettled, except in the minds of propagandists. A valuable contribution to the study of this question has just been published by the Medical Research Council, in the form of a report on "the relation between home conditions and the intelligence of school-children." Unfortunately, the study was interrupted by the death of Mrs. Frances Wood who collected the data, the material being tabulated and analysed by Dr. Isserlis. Mrs. Wood had intended to investigate the relation not only of home conditions, but also of physical health and hereditary parental abilities to the intelligence of children. Had all this been carried out with the same thoroughness and care that characterise the published report, it would have been no insignificant contribution to the solution of a problem with wide social, political, and economic implications. Nevertheless, as it stands, the report is a model for the study of these problems. The correlation between the school-child's intelligence and his environment works out in Mrs. Wood's study at between 0·3 to 0·4, a lower figure, as Mr. Cyril Burt points out in a foreword, than has been obtained in previous work. By itself this only proves that improvement of home conditions may be expected to react upon the intelligence of the children, but the eugenist may still contend that improvement of home conditions is largely dependent upon the hereditary qualities of the parents. It is much to be desired that the investigation should be pursued further on the lines originally intended.

HEAT PENETRATION.

Sol est remediorum maximum is a saying attributed to the elder Pliny, and no doubt sun treatment is as old as human culture, but its exact study is of recent date. An admirable chapter by Dr. A. Rosselet, lecturer on physicotherapy at Geneva University, on the scientific basis of heliotherapy is contained in Dr. A. Rollier's new book [1] on Heliotherapy, to which we shall return. Here we are concerned with the penetration of heat to the deeper tissues of the body. Dr. Rosselet regards it probable that the rise of temperature which takes place during sun-bathing, especially in well-acclimatised patients, is due in part to direct warming of the blood. In Finsen's Clinic at Copenhagen Dr. C. Sonne showed that luminous rays are far more effective in heating up the blood as it circulates in the skin than are the infra-red rays, and in this development of warmth he saw the principal physiological factor of sun treatment. It is generally agreed that the effect of direct sunlight exceeds in therapeutic potency that of any other variety of rays. The effect of light and heat rays on various tissues of the body has now been made the subject of close study at the National Institute for Medical Research, and in our present issue Dr. Leonard Hill and Dr. J. A. Campbell record some interesting results of experimental work, the temperature being determined by delicate thermo-electric couples mounted in hypodermic needles ingeniously designed by Dr. E. J. Schuster. The authors found that exposure of the whole body of a rabbit to the sun's rays at Hampstead rapidly increased the temperature of the deeper tissues; exposure of the head and upper part of the body alone was, on the contrary, followed by a fall of temperature. Local exposure of the head resulted in a definite increase of temperature of the scalp and brain. They came to the same conclusion as Sonne—namely, that the luminous rays actually heat up the subcutaneous tissues to a greater degree than do the non-luminous rays.

Another interesting study of heat penetration appears in the *Japan Medical World* for Feb. 15th, where Surgeon-Lieutenant N. Fukui records the effect produced by subjecting the testicle of a rabbit to the action of heat. He has found that heat produces very definite regressive changes in the seminiferous tubules, changes that are similar and just as intense as those effected by ligature of the vas or exposure to X rays. For the purpose of his experiments he employed sunlight, a powerful arc light, and warm water baths. Histological examination of the testicle after exposure to these agencies showed that selective destruction of the generative cells of the tubules had taken place, leaving the Sertoli cells and the interstitial cells of Leydig intact. Indeed, as after ligature of the vas, there would appear to have been some proliferation of the latter. A point of interest in the experiments is that a comparatively low temperature was sufficient to produce change; thus exposure of the scrotum of a rabbit to afternoon sunlight in summer, for a period of three hours, gave rise to the phenomenon termed by the writer "heat-testicle." Similarly a warm bath at 45° C., for the same period of time, produced identical changes. These observations, if confirmed, have a bearing on more than one problem in medicine. It is only within recent years that the importance of male sterility has been realised and the discovery that spermatogenesis is so sensitive to changes in the temperature of the testicles may throw light on

[1] Oxford Medical Publications. 1923. 25s.

otherwise inexplicable cases of azoöspermia. Again, should the induction of regressive changes in the seminiferous tubules by exposure to heat prove to be effective in man, it would provide an alternative method of bringing about the artificial sterilisation of undesirable males. One of the objections raised to the enforced sterilisation of undesirables is the fact that up to the present an open operation is the only permanent method of achieving it. Exposure of the testicles to warmth or sunlight entails no risk or hardship to the subject, and should it be effective would afford a satisfactory solution to a difficult problem. It is, however, in the highest degree improbable that the regressive changes noted by Dr. Fukui are permanent and that lifelong sterility can be achieved by exposure of the testicles to such a low grade of heat for so short a period. Sterilisation by means of X rays, unless a particularly intense action on the testicle is achieved, is only temporary, and we should expect the same to hold for sterilisation by means of heat. The fact that Dr. Fukui has noted an increase in Leydig cells concurrently with regressive change in the tubules is of special interest at the present time when attention is being directed to Steinach's observations on the results of ligature of the vas. Dr. Fukui's work must be repeated and confirmed not only by experiments on other animals, but by observations on the human being before it is safe to make any deductions. If the degree of heat necessary for the degeneration of the seminiferous tubules is so slight it should be feasible to obtain evidence of diminished fertility in stokers, cooks, and Turkish-bath attendants, and thus to confirm or refute Dr. Fukui's laboratory observations on rabbits, dogs, cats, guinea-pigs, rats, and goats.

MUSCULAR DYSTROPHIES.

AT the Devon and Exeter Medico-Chirurgical Society Dr. W. Gordon showed a case of pseudo-hypertrophic muscular paralysis, in which tenotomy for talipes equinus, performed by Mr. B. D. Dyball, had restored the ability to walk. Dr. Gordon pointed out how very greatly our conception of the muscular dystrophies had been simplified by accumulating knowledge of the rarer forms of disease. Formerly four varieties were separately described—the common pseudo-hypertrophic type and three much rarer varieties, atrophic from the onset—namely Erb's so-called "juvenile" type, Landouzy and Dejerine's "facio-scapulo-humeral" type, and Gowers's "distal" type. It was now known that, whereas the primarily atrophic varieties commonly occurred within affected families, sometimes one, sometimes another making appearance, pseudo-hypertrophy kept itself to itself. Hence it was sufficient for practical purposes to distinguish two types only of muscular dystrophy, the pseudo-hypertrophic and the primarily atrophic. Dr. Gordon laid stress on the following points of difference, eight in number:—

1st, and chief in respect of *prognosis*, the pseudo-hypertrophic died in nearly every case at or before puberty. The others commonly survived for many years.

2nd, and next in importance from the *diagnostic* standpoint, marked initial hypertrophy only occurred in the pseudo-hypertrophic.

3rd, regarding *treatment*, contractures were much more marked in the pseudo-hypertrophic.

4th. Pseudo-hypertrophics were generally diagnosable at 5 or 6 years of age; the others might begin at any age and generally at a much later one—for instance, Erb's misnamed "juvenile" type—usually first appeared between 15 and 35 but might begin in early childhood or in later life.

5th. Five out of six pseudo-hypertrophics were *boys*; the others were as often females as males.

6th. Pseudo-hypertrophics were much more apt to present no *history* of other cases in the family.

7th. Each type tended to *breed* true.

8th. The *muscles* most affected differed to a certain extent. Thus, although the lower parts of the great pectorals and the whole of the latissimi dorsi usually wasted much in both types, the pseudo-hypertrophics never had the face affected, although masseters and tongue rarely enlarged, whereas in the other type the face might suffer and, indeed, suffered first and characteristically in the Landouzy-Dejerine variety. In pseudo-hypertrophics the trapezius rhomboids, or serratus were rarely affected, equally rarely the infraspinatus, supraspinatus, and deltoid in the other forms; while in pseudo-hypertrophics it was just these three muscles that were commonly and considerably enlarged.

In both types the diagnosis rested on three common features: The absence of fibrillation in the affected muscles, in contrast to the progressive muscular atrophies of spinal origin; the absence of all sensory changes; and the absence of reaction of degeneration. The case shown could be diagnosed at a glance, although only one group of muscles was pseudo-hypertrophic—viz., the calves. The coincident atrophy of the latissimi dorsi and of the lower fibres of the pectoralis major; the common history of difficulty of going upstairs; the obvious waddle; and the attempt to "climb up his own legs" when seated on the floor and told to get up—only frustrated by his pronounced club-feet—were sufficiently distinctive. Lifted by his armpits the boy simply slipped through the hands. To discover, said Dr. Gordon, pseudo-hypertrophic paralysis it was essential to look at the back. Only one muscular group was usually enlarged in front—namely, the thigh extensors; if hypertrophy was confined to one group of muscles, it was usually behind, the three commonest sites being the calves, the buttocks, and the infraspinati, the next commonest the supraspinati, deltoids, and triceps. Two muscles wasted primarily in all forms of the disease—namely, the latissimus dorsi and the lower part of the pectoralis major. Prognosis in pseudo-hypertrophic paralysis was unhappily of the worst—scarcely any case passed puberty; but it was well not to be too confident, for one patient was said to have survived to 40. Once bedridden, the downward course was greatly accelerated. Dr. Gordon concluded by calling attention to our lack of resource in muscular complaints generally, apart from so-called myalgias. Even in myositis the accepted remedies were not strikingly helpful. In muscular dystrophies, in myotonias, in amyotonia congenita of Oppenheim, and in myasthenia gravis medicine had hitherto to confess its impotence.

VETERINARY PRACTICE OF A BYGONE AGE.

THE second volume of Sir Frederick Smith's great History of Veterinary Literature in Britain During the Eighteenth Century is appearing in instalments as a supplement to the *Veterinary Journal*. In the first instalment the author notes that animal diseases were treated by two classes of practitioner, known as *farriers* and *cow-leeches*, both of whom borrowed their knowledge from writers on human anatomy and physiology. There was little original work or study of cause and effect, although certain individuals who came from among the ranks of the surgeons—e.g., Gibson, Osmer, and Taplin—built up good veterinary practices. In 1714 Thomas Bates, F.R.S., surgeon to H.M. household, dealt with an outbreak of cattle plague on lines differing little from those employed in cattle epidemics of the present day. But many of the books were written by laymen who were copyists. In 1730, however, William Burden, a captain of cavalry, endeavoured to convince the public that "the study of veterinary medicine and surgery is the work of an educated man and not the function of farriers, coachmen, and grooms." The influence of Solleysel, the French veterinarian, on much of the literature of the day was very noticeable. Henry Bracken, M.D., 1687–1764, to whom we owe the really enlightened books of the period—"Farriery Improved" and "The Traveller's Pocket Farrier"—himself the son of a Lancaster surgeon, although an unblushing plagiarist, brought in some clear reasoning of his own, and his treatment was simple, rational, and clean. He was also a firm believer in the prevention of disease, although he lived in a time when the liver of an eel, the flesh of the viper, the penis of a tortoise, and the moss from human skulls were stock therapeutic agents. Progress in animal medicine was necessarily very slow until the foundation of veterinary schools at the end of the century, first in France and

afterwards in this country. The lesson can clearly be drawn from Sir Frederick Smith's narrative that no real advance is possible in any branch of medical science without facilities for research into the causes of disease. The veterinarians of the eighteenth century were for the most part travelling round in a circle with no clear or intelligent guidance; their premises being false, their practice was devoid of useful result.

ASYLUM NURSING IN PARIS.

LAST November, after a preliminary study by Dr. A. Antheaume, the supervising committee of the Asiles de la Seine decided that in certain male wards of the Paris asylums the male attendants should be replaced by female nurses. The change, Dr. A. Rodiet tells us in a recent issue of *Le Progrès Médical*, is strenuously resisted by the attendants themselves, who take their stand on the ground that the morals of the nurses will be corrupted. Dr. Rodiet, who is himself in charge of the Ville-Evrard Asylum, points out that the experiment has been tried elsewhere, especially in Holland, where male attendants have disappeared, and that the experimental stage has been passed in more than one country. It is curious that he makes no reference to Britain, although at Morningside Prof. G. M. Robertson broke the first ground, and the authorities of Cardiff City Mental Hospital have carried the substitution of women for men to greater lengths than are contemplated in Paris. For the French proposal amounts to no more than to employ nurses for helpless and harmless patients who are confined to bed, general paralytics in the third stage, and congenital imbeciles or idiots. These limitations would certainly protect the nurse from offensive conduct on the part of patients. We must not overlook the advantage of a hospital atmosphere and the sympathetic care of women in cases where recovery is possible and capable of acceleration by congenial environment. It was with this object that the nursing of male patients by women was introduced in this country.

CHRONIC COWPERITIS.

Dr. Harry Cohen and Dr. Ralph L. Dourmashkin[1] of New York, who report an illustrative case, remark that in spite of the enormous quantity of literature on the various aspects of gonorrhœa, surprisingly little has been written on the subject of chronic infection of Cowper's glands as the underlying cause of recurrent attacks of chronic urethritis. The onset of acute cowperitis is ushered in by chills, rise of temperature, pain and tenderness in the perineum, and pain on defæcation. The involvement is usually unilateral and is shown by redness, swelling, and induration in the perineum. Resolution takes place or the process goes on to suppuration, the abscess bursting either into the urethra or perineum and occasionally giving rise to a urinary fistula. The gonococci may remain in Cowper's glands for months or years and be the cause of reinfection of the urethra. The writers maintain that many cases of chronic urethritis attributed to prostatitis are really due to chronic cowperitis. The diagnosis of chronic cowperitis can be made by palpation of the inflamed gland, as in the case of chronic infection of the prostate or seminal vesicles. When Cowper's gland is enlarged it can be felt just anteriorly to the membranous urethra, which is in the middle line and at the lower margin of the prostate. Urethroscopy is also a valuable guide, as it shows the inflamed mouths of the ducts. Unlike its homologue Bartholin's gland, Cowper's gland is rarely infected by any other organism than the gonococcus. Tuberculosis of the gland, however, has been described by a few writers, so that in chronic cowperitis, with or without a fistula, a careful search should be made for tubercle bacilli. Treatment of chronic cowperitis consists in massaging the gland at regular intervals by inserting the index finger into the rectum and compressing the perineum with the thumb outside. If massage is unsuccessful, excision of Cowper's gland is indicated, just as in the case of chronic gonorrhœa in the female where excision of Bartholin's gland has been advocated. In the case reported by the writers, in a man aged 28 suffering from chronic gonococcal urethritis, massage failed to produce any relief, but complete recovery rapidly took place after excision of an inflamed left Cowper's gland.

[1] Urologic and Cutaneous Review, March, 1923.

CONGENITAL ANOMALIES OF THE EYE.

IN another part of this issue Miss Ida C. Mann deals with a number of congenital anomalies of the eye which are liable to be confused with acquired conditions. It is important for the practitioner who takes any part at all in the treatment of eye diseases to be acquainted, not necessarily with every sort of anomaly which is liable to occur, but with those which may simulate the result of disease. A good example of this is the remains of pupillary membrane, a developmental structure which sometimes fails to be completely absorbed, leaving strands of tissue which are liable to be mistaken for synechiæ resulting from acute iritis. The diagnosis should be easy with the help of a corneal loupe, but cases occur in which considerable care is required to determine whether the strands are attached to the margin or to the anterior surface of the iris. The most common congenital anomaly to be seen with the ophthalmoscope is caused by the persistence of the medullary sheath of the optic nerve fibres beyond the optic disc, where in normal cases it stops, causing white patches on the surface of the retina which to the uninitiated are liable to be mistaken for choroidal atrophy. In these and other cases, however, the question of treatment hardly arises, so that the results of a wrong diagnosis are not as a rule serious. Far different is it in certain cases where appearances due to congenital anomalies resemble what may be due to serious or even fatal disease. Here a little knowledge may be a dangerous thing. There is such a thing as pseudo-optic neuritis, a congenital condition; but he would be a bold man or woman who without a large experience in the examination of eyes should dismiss a disc with blurred margin after one examination as a case of this nature. If there is any suspicion of optic neuritis, the only safe rule is to keep the case under observation, at any rate, for a time. Similarly with congenitally large physiological cups, it is sometimes a matter of the greatest difficulty to distinguish them from glaucoma cups, and the result of examining the patient too hastily may be to lose valuable time in the diagnosis of an insidious disease. Other examples of possible disasters from a too hopeful diagnosis, given by Miss Mann, are the confusion of melanotic sarcoma with a subconjunctival mole, and the diagnosis of glioma as a persistent hyaloid artery.

PREVENTIVE INFANT FEEDING.

Prof. H. J. Gerstenberger, professor of pediatrics at Cleveland, Ohio, contributes to the March number of the *American Journal of Public Health* a practical résumé of our present knowledge of the means for prevention of nutritional disorders of infants and young children. Nutritional disorders in infants owe their occurrence to a variety of causes, such as hereditary factors, infections, bad housing, lack of sunlight, and inadequate diet, among which the most important, in Dr. Gerstenberger's view, undoubtedly is the last named. He adds that "those who state that infant feeding as it is practised even to-day in the big general way is successful are either blind, ignorant, or deceitful." His review of the percentage, or American, system of infant feeding is valuable historically, the results from the standpoint of general successful application having been small and disappointing; and he lays down the following as the qualifications needing to be fulfilled by an artificial food when the use of this cannot be avoided. The food must be complete if rickets and other nutritive disorders are to be avoided; the method of preparation must be

simple; the initial cost must be within the reach of the mass of consumers; it must be free from pathogenic germs; and it must "keep." Evidently a food which meets all the above requirements cannot be obtained in every home, and although success may be achieved in some instances by domestic methods, Dr. Gerstenberger arrives at the conclusion that "only one plan will work that will accomplish this purpose and at the same time be hygienic, economic, and practical as well, and that is the manufacture of such a product on a large scale and in a form that is handy for both parents and family physician." Such attempts have been made in the past, and they have not succeeded because (*a*) fat and mineral adaptation were not considered; (*b*) the importance of the regular addition to the diet of the anti-scorbutic vitamin was not recognised; and (*c*) the need of the anti-rachitic vitamin was unknown. Experience in Cleveland has shown that with the use of milk in dry or sterilised liquid form altogether satisfactory results can be obtained, given attention to the three points indicated above.

ALFRED HENRY FISON.

Dr. A. H. Fison, D.Sc. Lond., the secretary of the Gilchrist Educational Trust, who lost his life recently by an accident while fixing up a wireless aerial, was a very accomplished man and forceful personality, and his death is a real loss to the cause of scientific education. Born in 1857, he came of a family with old-fashioned Puritan ideals, which seem to have included a distrust of scientific knowledge and research. But in spite of his early environment—or, some may think, perhaps in consequence thereof—he adopted a scientific career, and became not only a lecturer with the rare gift of imparting his special information in an interesting manner to a general audience, but also a sound administrator and a teacher who earned the esteem of both pupils and colleagues. After graduating in science at the University of London he was appointed demonstrator under Prof. Carey Foster in University College. Here, later, he became assistant professor of physics in the College, and also staff lecturer in physics for the Oxford University Extension Delegacy. His appointment as lecturer in physics at Guy's Hospital dates from 1906, and the similar position which he held at the London Hospital Medical School, from 1910. The story of Dr. Fison's life is fully told in biographical notes published in the last issue of the *Guy's Hospital Gazette*.

THE TREATMENT OF SYPHILIS WITH BISMUTH.

IN the paper published on this subject by Dr. C. Levaditi in THE LANCET for March 31st it was stated that the first experimental tests of the toxicity of bismuth with a view to its exhibition in syphilis were carried out as long ago as 1889 by Balzer. Considering how remarkably effective this drug has recently proved itself in syphilis, it is strange that its usefulness in this respect should have been disregarded for so long. It is not as if bismuth were seldom given for other diseases; it has, for example, been extensively used for many years in the treatment of gastric ulcer and other diseases of the gastro-intestinal tract, and the drug must often have been given for these diseases in persons also suffering from syphilis. Why, then, was its action on syphilis not noticed earlier? However, the impression which bismuth has made as an antisyphilitic remedy during the last few years on our French colleagues seems to have been very great. In a recent number of *Le Progrès Médical* Dr. M. H. Grenet has published details which form a useful supplement to Dr. Levaditi's paper. The preparations in use may be classified according as they are soluble or insoluble, and the indications for each are practically the same as for the soluble and insoluble preparations of mercury. An intramuscular injection of a soluble preparation of bismuth is the safest, for if toxic symptoms occur they can quickly be arrested by discontinuing the injections. But if an intramuscular depôt of an insoluble preparation has been left, and toxic symptoms supervene, it is practically impossible to remove the depôt. On the other hand, such a depôt provides a more continuous and prolonged action of the drug, the injection of which need not often be repeated. Dr. Grenet makes it abundantly clear that bismuth is far from being a safe drug to inject. He does not give it by intravenous injection as recommended by certain of his colleagues, and he prefers the intramuscular route, partly on account of its greater simplicity. But even when given by intramuscular injection bismuth may give rise to stomatitis, hæmorrhagic enteritis, nephritis, and other complications. Indeed, as far as the kidneys are concerned, bismuth would seem to be more dangerous than mercury. On the other hand, though an excess of bismuth may injure the nervous system, the drug seems to be more effective than its two chief rivals in the treatment of syphilis of the nervous system. It is claimed for bismuth that it is particularly useful in cases which have proved arseno- and mercurio-resistant. But it is disappointing to read that bismuth has a less rapid effect on the Wassermann reaction than the arsenical preparations, and Dr. Grenet is wise in not claiming for bismuth a position of unquestioned pre-eminence among the antisyphilitic drugs. It may have a great future, but it has yet to stand the test of those late syphilitic diseases of the nervous system which have in the past so often mocked successful "cures."

THE OPEN PULMONARY TUBERCULOSIS OF OLD AGE.

THE tendency to regard the chronic bronchitis and emphysema of old age as a manifestation of active pulmonary tuberculosis seems to be growing. Many a case of infection in early childhood has, it is true, been traced to a bronchitic grandparent or a pensioned nurse with "asthmatic" proclivities. The literature of this subject is fairly bulky, and some of it reflects rather hardly on the aged as sources of contamination of the young. One of the most striking papers on this subject was published several years ago by Oppenheim and Le Coz, who performed necropsies on 330 old men, 60 of whom had died of tuberculosis. Among these 330 they found definite tuberculous lesions in 246, and in as many as 103 cases the tuberculous disease was still active. Thus they found active tuberculosis in 30 per cent. of their cases. In *La Presse Médicale* for March 24th Dr. P. Halbron and Dr. G. Potez have published observations which suggest that in being allotted the sinister rôle of tuberculosis carriers the aged may have often been maligned. The material examined consisted of about 1200 old men living in a "retreat." Among them there were 500 under medical treatment, and among these again 40 were selected for special examination. Certain of them had records of hæmoptyses and pleurisies, and there were signs of diffuse bronchitis, emphysema, and pleurisy. In as many as 21 of the 40 there were signs of apical lesions. In 15 out of 18 cases examined by the X rays signs indicative of tuberculous lesions were found. An exhaustive search was made for tubercle bacilli in the sputum, many sputum-positive cases being expected, but in none were tubercle bacilli found. This surprising result was confirmed by the findings in 21 necropsies. In as many as 17 there was, indeed, evidence of tuberculosis, but it was invariably arrested and inactive—never acute or even showing signs of chronic activity. The authors suggest that the comparatively sheltered life led by these old men may, at any rate partly, explain why their tuberculous lesions showed no activity, and it is possible that Oppenheim's and Le Coz's subjects showed such a high incidence of active tuberculosis because they were largely recruited from the most destitute classes. If this is the correct explanation of the remarkable difference in the two series it is a cogent argument in favour of taking

better care of the aged than is usually the case. Although the findings of Dr. Halbron and Dr. Potez are a useful sedative to scaremongers, it is obvious that a certain proportion of senile bronchitics and asthmatics must be disseminators of tubercle bacilli, and in justice to the non-tuberculous bronchitics it would be well if in every case of senile bronchitis the sputum were examined.

PRUSSIC ACID FUMIGATION.

A TRAGEDY at Chicago has recalled public attention to the dangers to human life of prussic acid fumigation. It appears that the owners of a basement restaurant, desiring to rid their premises of the attentions of the cockroach, entrusted the job to a man professionally engaged in the extermination of insect pests. This operator appears to have been at some pains to seal openings leading from the restaurant into the upper parts of the same building and to warn the other occupants to keep their windows open during the night. But an opening giving passage to a water-pipe was overlooked, with the result that the gas generated by the action of sulphuric acid on sodium cyanide escaped into a second-floor apartment to such purpose that six occupants lost their lives. There is no vestige of doubt that in prussic acid we are in possession of a handy and highly efficient vermin-killer, although its bactericidal action may be small. Unfortunately the gas is no respecter of persons, and we can only hope that the United States Government, which has insisted on the use, under proper safeguards, of hydrocyanic disinfection for ships arriving at American ports will also insist on its limitation in civilian communities to duly accredited officers. The amazing toxicity of the combination of one atom each of hydrogen, carbon, and nitrogen should preclude its use as a fumigant by anyone not directly responsible to the local sanitary authority. A few more such accidents as that which occurred in Chicago and the civilised world will refuse to have anything more to do with such a treacherous weapon.

THE CONTROL OF GOITRE IN MICHIGAN.

IN a *Bulletin* issued from his department of health, the new Sanitary Commissioner for Chicago, Dr. Herman M. Bundesen, admits that goitre is on the increase in that city as well as along the shores of Lake Michigan and in the region of the Great Lakes in general. A survey of the public schools is now taking place in order to obtain exact information as to the extent of the affection amongst school-children, and a campaign of education amongst them will follow. Official goitre clinics are to be established throughout the city of Chicago. Dr. Bundesen himself thinks that the maximum of prevention coupled with the minimum of effort will be obtained by giving iodine continuously between the ages of 11 and 17 years. He quotes the result of two and a half years' treatment and observation amongst school-girls in Akron (Ohio), where some 2000 pupils were induced to take 2 g. of sodium iodide twice yearly. Among these only five individuals developed goitres, while among a similar number not taking prophylactic treatment nearly one-quarter showed thyroid enlargement. The conception of goitre as an iodine-deficiency disease is steadily gaining ground in the Western States of America, since it was found that in Portland (Oregon) and in Seattle and Tacoma (Washington) a rapid increase in goitre followed on an installation free from iodine brought from the Cascade Mountains.

WE are informed that the British Drug Houses, Ltd., and Messrs. Allen and Hanburys, Ltd., working in conjunction, have overcome the technical difficulties of making insulin and are now prepared to supply it in moderate quantities. Their product is to be known as the A.B. brand. Although some thousands of doses have been made, the quantity available at present will not suffice to meet all requirements. Preference will therefore be given in supplying hospitals and medical men possessing facilities for pathological testing.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XV.

THE TREATMENT OF INTESTINAL WORMS.

Tape-Worms.

THE secrets of success in the treatment of cases of tape-worm are (1) proper preparation of the patient, and (2) adequate dosage of the vermifuge. The patient should be kept on a liquid diet (1½ pints of milk and 1 of beef-tea) for 48 hours. During this period he should remain at rest, preferably in bed, and the bowels should be thoroughly cleared out by an efficient daily aperient—e.g., ℥ i. sulphate of soda t.d.s. Early on the morning of the third day he should be given a saline purge, and two hours afterwards the vermifuge should be administered. Liquid extract of male fern is usually employed, the dose being 1 drachm for a child and 1½ drachms for an adult. It may be given either in ℥15 capsules or as a draught made up with mist. amygdalæ co., and flavoured with a little oil of peppermint. If the capsules are used, one may be given every quarter of an hour until four or six have been taken. Two hours later a purge should be administered. Castor oil, though often employed, is not to be recommended for the purpose as some poisonous constituents of male fern are soluble in it. It is better to use black draught (mist. sennæ co.) or a seidlitz powder. If the bowels have not acted within an hour they should be emptied by an enema. The motions should be passed into a vessel containing warm water, and should be strained through black muslin to facilitate the search for the head.

Even when the above directions are carefully followed failure to get away the head will result in a good many instances. In that case there is nothing to be done but wait until segments reappear in the motions, and then to repeat the treatment. Other vermifuges are not likely to be more successful, but pelletierine tannate is worth a trial. It may be given after the usual preparation of the patient, in a dose of 8 gr., followed in two hours by 1 oz. of castor oil. It is not to be recommended for children below the age of 10.

Before the war I was in the habit of using the preparation known as filmaron with great success. It consists of the active principle of male fern dissolved in castor oil, the dose for an adult being ½ oz. or more. It is a German preparation, and is not now obtainable in this country. Chloroform and turpentine have also been used, but in the doses required are not devoid of risk. If chloroform is tried 1 drachm should be shaken up with 1 or 2 minims of croton oil, and given in half a tumblerful of milk whilst fasting. I have had no personal experience of this plan, but it has been highly spoken of.

Round Worms.

Santonin is an effective remedy for this form of parasite. The dose for an adult or a child of 12 years is 5 gr., and for a child of one year, 2 gr. It should be given in the morning on an empty stomach either as a powder, with the addition of ½ gr. calomel and 2 gr. of compound scammony powder, or in an emulsion containing ½ oz. castor oil. "Yellow vision" and redness of the urine may result, but are of no importance and disappear in 24 hours. As prophylactic measures all drinking water should be boiled, and raw vegetables avoided or thoroughly washed before consumption.

Thread-Worms.

The old-fashioned enemata are often effective if persistently used. The proper strength is 1 oz. of salt to the pint, and the injection should be repeated every other morning for a month. Infusion of quassia may be used instead, in a strength of 1 in 40 (which is stronger than the B.P. infusion), or the salt may be

added to the infusion. The injection should be given warm through a funnel and tube, the pelvis being raised. One and a half pints may be given to an adult, and 6 oz. or more to a young child.

A convenient local treatment is the use of suppositories containing 7½ gr. of strong mercurial nitrate ointment. (In the case of children below the age of 4, a smaller suppository may be used.) One of these suppositories is inserted every other night. A little blue ointment inserted nightly into the rectum is perhaps as good. Amongst internal remedies santonin may be used in the same way as for round worms, or male fern as for tape-worm. Sulphur also is often effective in old-standing cases. It may be used either in the form of a morning dose of a sulphate water, or one or two sulphur lozenges may be given after each meal for prolonged periods. The writer has found it very useful in old-standing cases of thread-worms in adults.

Whatever treatment is adopted, it is important to take measures against re-infection. With this object the child should wear such sleeping garments as make access of the fingers to the anus impossible, and a little white precipitate ointment should be inserted into the anal canal and smeared round the orifice at bed-time. The same precautions should be taken, as regards diet, as in the case of round worms.

In all chronic and recurring cases the amount of starchy and sugary food should be cut down—patients have been cured by adopting a diabetic diet—and regular action of the bowels ensured either by the use of rhubarb and grey powder or of paraffin. There can be no doubt that the appendix often serves as a breeding ground for thread-worms and that the bowel can be constantly re-infected from it. In obstinate and old-standing cases in adults removal of the appendix has therefore been suggested in order to root out the parasites, but I am not aware that operation has ever actually been done solely with this object.

ROBERT HUTCHISON, M.D. Edin.,
Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street.

Special Articles.

BODY HEAT AND EFFICIENCY.

THE fear of exposing the healthy body to cold, a tradition perpetuated by the popular nomenclature for infections of the nasal passages, should be finally extinguished by the results of the further observations with the kata-thermometer[1] just published. For too long hothouse conditions, suitable for the failing powers of the aged, for the injured in a state of shock, and for those suffering from chronic inflammations of the respiratory passages, have been regarded as equally suitable for the young and healthy. For fear of "catching cold" children were confined indoors in inclement weather, over-clothed, and at the same time exposed freely to massive infection in crowded places, while the need of abundant open-air exercise, to make them eat and metabolise their food, was neglected. The kata-thermometer was introduced by Dr. Leonard Hill, F.R.S., to measure the cooling and evaporative power of the environment of the skin and respiratory mucous membrane, since the suitability of atmospheric conditions for healthy individuals had been found to depend largely on properties not measurable by the ordinary thermometer.

In former green books (Nos. 32 and 52, Special Report Series, Medical Research Council) the results of earlier investigations were outlined, and the present volume represents the advance in the study of the kata-thermometer since their publication. Many new points have emerged. While it is not definitely established that conditions condemned by the results of these studies do directly increase either morbidity or mortality, it is, at any rate, proved that atmospheric conditions, classified on the objective basis of kata-thermometric readings as unsatisfactory, are hard to endure; that in every case in which subjective sensations were controllable by objective test on industrial output, the test gave proof of diminished efficiency; and that the *tempo* of the fundamental metabolic processes of the body responds rapidly and considerably to changes of atmospheric condition. Certain interesting side issues have arisen. The desirability of habitual exposure of the young to cool atmospheric conditions is proved positively by the wonderful vigour of children undergoing open-air treatment, and negatively by the reluctance of those long accustomed to high temperatures and deficient cooling power to use the means provided for their mitigation. For example, potters, who start work at the age of 14, get so acclimatised to high temperature that they feel uncomfortable without it and do not take full advantage of the windows provided. Acclimitisation certainly increases the difficulties of applying the results of kata-thermometric readings to industrial conditions, but it is now established that mostly the worker's comfort as well as his efficiency is greatly increased by adequate air movement. The selection of an exact index of comfort has been found difficult. Under certain conditions, as when men are working naked in deep mines, the wet kata-thermometer affords a very exact index. When clothes are worn, however, the close comparison no longer holds. If it is known that the air temperature is a reasonable one the dry kata cooling power may be accepted as a fair index of comfort. This must be read in conjunction with the wet bulb reading and the dew point. We have not at the present time sufficient information to show what amount of air movement is desirable at various levels of wet bulb temperature, but it is gradually being collected in different industries.

Atmospheric Conditions in the Workshops.

The adequate investigation of the atmospheric conditions in a workshop is a laborious process. Observations have to be made at various times, seasons, and places. Again, the nature of certain industrial processes requires special atmospheric conditions, whereas in others no relaxation of normal standards need be required. Among the industries in the latter group investigated, in boot and shoe factories conditions were found to be fairly satisfactory, in printing works much less so. In the former group are certain textile processes where a hot and humid atmosphere, essential to the maintenance of the quality and quantity of the material woven, causes much discomfort to weavers in summer. Here, by the use of suitable ventilating fans, or an ingenious method of attaining the same end—attaching strips of material to the moving heald roller of the loom, the movement of air in the vicinity of the worker, and consequently his comfort, may be greatly increased. A comparison of conditions in several laundries led to the belief that in many cases the temperature could be lowered and the ventilation improved to the relief of the employees; while in potters' shops the workers themselves will have to be educated to take advantage of the ventilation provided before more can be fairly demanded.

General Studies.

We have commented mainly on the industrial aspect of the work, recorded by Dr. H. M. Vernon, but actually only a small part of the physiological investigations detailed in this report is concerned therewith. Other sections include a technical study of the kata-thermometer as a physical instrument by Miss D. Hargood Ash and Dr. Hill; a comparison of kata-thermometer readings in temperate, alpine, and subtropical climates, with a note on the effect of increasing or lessening the humidity of the air in a room by Dr. Hill; kata-thermometric comparisons of methods of heating and ventilation by Mr. T. Bedford and Mr. T. C. Angus; ventilation tests on board a

[1] The Kata-thermometer in Studies of Body Heat and Efficiency. Medical Research Council, Special Report Series No. 73. H.M. Stationery Office. 1923. Pp. 196. 5*s*.

large Atlantic liner by Mr. Angus; and observations on metabolism during rest and work, with special reference to atmospheric cooling power, by Dr. Hill, in collaboration with Dr. J. Argyll Campbell. In this section is a note on the preservation of life in shipwrecked persons, which may be of great practical importance. It is proposed to substitute rafts for boats on ships, as rafts can be piled on deck in larger numbers. The provision of concentrated food or drink in the lockers is regarded as of little importance compared with the problem of preserving body heat. The conclusions reached from experimental drenching of a most self-sacrificing volunteer is that the complete covering even of wet clothes by thin mackintosh suits, which could be stored in the lockers, would afford great protection and thus contribute largely to the preservation of life in survivors of the wreck.

Three appendices by Dr. G. H. J. Schuster, Miss May Smith, and Mr. Angus conclude a report which, with its predecessors, will long remain the reference for those undertaking investigations of atmospheric conditions.

The observations summarised in these reports are sufficient to indicate the value of kata-thermometer readings in factories, workshops, and on board ships, where incidentally the use of heated air for purposes of cabin ventilation is likely to be superseded in the future by fresh air combined with direct heating, radiators being employed where required. Even a considerable outlay in installing better systems of ventilation would repay itself in many shops and ships, and it is evident that further controlled systematic investigations on the pattern provided will lead to valuable results.

MEDICINE AND THE LAW.

MARRIAGE AND PROFESSIONAL CONFIDENCE.

A CORRESPONDENT inquires how far a medical man is "right in telling a wife what is the matter with her husband, if she asks," and states the case which prompted the question. The husband had contracted syphilis many years before his marriage, and there was no evidence that he had ever infected his wife. His symptoms pointed to some affection of the nervous system, the actual cause and name of which the wife demanded to be told, refusing to be put off with any evasion of her inquiries. What should she be told? There is a good deal of difference here from the usual difficult position summarised by Dr. Amand Routh in an article on "Syphilis and Marriage" in THE LANCET of March 31st. Here Dr. Routh was referring to the position of a medical man desirous of preventing the marriage of a syphilitic patient, male or female, who refuses to desist from his intention in response to advice. He pointed out that to warn the parents of the other contracting party, or that other party, himself or herself, might not only be regarded as a breach of confidence, but might form the subject of an action for defamation. The latter risk, we suggest, should be disregarded as trifling, for no judge or jury would be the least likely to treat such a communication as anything but privileged, if the medical man failed to prove it true in substance and fact, but could show also that he had not made the allegation rashly. Of the question of professional secrecy the same certain language cannot be used: opinions differ as to the medical man's duty, and every practitioner must therefore bear the responsibility of his action. No one can fall back upon an inviolable rule, and there is no law of the State enjoining professional secrecy. The patient's secret should be rigorously kept subject to conditions sometimes affecting particular cases, and the difference between the situation of the person already married who has not contaminated the partner, and that of the person proposing to marry who may contaminate the partner, is obvious.

This is held to be the ethical attitude of the medical profession. It is not required that a medical man should go to prison for disobeying a judge's order to give evidence in the interest of justice, and there must be occasions and conditions when the most scrupulous professional conscience would acquiesce in the departure from principle. Such occasions and conditions are of infinite variety, and occur not only with regard to venereal disease, but as to what may be called "guilty secrets" generally; and not only with reference to possible revelation to a husband or a wife, but with reference also to revelation to other relatives, such as parents, or to strangers. Again, information may be sought from the doctor, or circumstances may suggest that he ought to give it unasked. The imaginable conditions are so varied that it has been found only possible to suggest a general principle of guidance. The patient's interests, physical or otherwise, must be the first consideration of the medical adviser, who must upon some occasions weigh against these the interests, physical or otherwise, of other persons.

In the particular question referred to us by our correspondent, it is not clear whether the patient would suffer or gain in respect of his health and treatment, or in other respects, by his wife being informed as to the cause of his illness; nor is it clear whether or not the husband might with advantage be induced to inform her himself. Upon the facts as stated it hardly seems that the wife would have any right to know more than her husband chose to tell her. The medical man has every right to protest, where he can do so, against being made a conspirator.

A DANGEROUS IMPOSTOR.

A man, who had signed his name to a bogus medical certificate as R. Cunningham Strachan, M.B., Ch.M. Edin., without having any such qualifications, was fined recently at the West London police-court £10, with the alternative of 28 days' imprisonment. He got off lightly, for the certificate which he signed was to enable a teacher to absent herself from her duties, as suffering from gastric catarrh, whereas in fact she was resorting to the house of a woman, named Maude Olive Beaumont, in order to have an illegal operation performed. It is true that there was no evidence that Strachan knew there was to be such an operation, or indeed that he even saw the girl, but she afterwards died owing to the operation, and Beaumont was sentenced to seven years' penal servitude at the Old Bailey, a sentence richly deserved. It is perfectly evident that Strachan must have known that the certificate would be used for some wrong purpose, whether he knew what that purpose was or not, and the danger to the public is considerable if certificates purporting to be issued by medical men can be given by any fraudulent person with comparative impunity. There was another person concerned with the death of the girl, who got off scot-free—namely, the man who introduced her to the abortionist, and who had had recourse to the same woman before; unfortunately his evidence was necessary in order to obtain her conviction.

INFANT INSURANCE.

An important case has come before the Shoreham Petty Sessional Justices. It was a prosecution under the Friendly Societies Act of 1896, Herbert Ward, an insurance agent, and H. M. Mackintosh, the Hove branch manager of the Pearl Assurance Company, being summoned for paying money on the death of a child under 5, which, added to other amounts payable, exceeded £6. There was also a summons against the defendants for paying money on the death of a child without inquiring what other amount had been paid. Mr. A. J. R. Haggard, for the Registrar of Friendly Societies, pointed out to the justices that a very important principle was involved in this question of child insurance. The Act was passed to prevent traffic in insurance of infant life and also to remove the bad moral effect caused by allowing parents to profit by the death of their children. There was no suggestion in these proceedings that any of those abuses had been practised. The Company had done its best at all times to ensure that the sections of the Act should be observed, and the Registrar of the Friendly

Societies was confident that the Company on realising that a mistake had been made had been zealous in trying to remedy it. Yet the Registrar, in view of the importance of the principle involved, felt he must take some action. The child was insured in three societies. Ward, the Pearl agent, made a payment of £3 15*s.*, but it was subsequently ascertained that this amount, with other sums payable by the other societies, brought the amount payable to just over the £6 maximum. Mr. H. E. Trangmar, on behalf of Ward and Mackintosh, pleaded guilty to a highly technical offence, which had been inadvertently committed; and Mr. Graham Hooper, for the Pearl Assurance Company, pointed out that it was through the immediate action of his clients that the matter was brought to light. Directly they knew of the fact they took steps for the matter to be brought to the notice of the Registrar. The Chairman of the Bench (Mr. W. A. Hounson) said the justices regarded the case as one having been brought forward in the public interest. It was of the first moment because it was evident that long years of consideration and very considerable legislation had taken place in order that abuses of this sort might be prevented. In the particular case only a small amount (5*s.*) was at issue, and the facts showed that the legislation had produced a very good effect, inasmuch as this was a very exceptional case. There would be no conviction, but the court costs (16*s.*) would have to be paid, while the application for £5 5*s.* expenses was perfectly legitimate and must be paid.

WHOLESALE SMUGGLING OF DANGEROUS DRUGS.

A man named Humphrey pleaded guilty recently at the Guildhall Police Court to a charge of unlawfully offering to procure morphine, heroin, and cocaine for the Tong Say Company, of Amoy, China, contrary to R. 3 of the Dangerous Drugs Regulations of May 20th, 1921. The transaction upon which the charge was based was not a solitary attempt to procure drugs, for the accused had previously almost carried through at least one deal of considerable magnitude, and his proceedings, as described by counsel, proved, if it were necessary to prove it, that only energetic and effective control, with the coöperation of all countries where abuses may take place, can check the trade in dangerous drugs—or, indeed, render it anything but an attractive business for unscrupulous and ingenious persons. Humphrey combined a hardware business in the City with the secret shipping of opium products in large quantities, and in sending the peccant stuff to China, was introducing it into a country in the teeth of prohibition by the Government. He was sentenced to the maximum penalty now provided, a fine of £200 and six months' imprisonment in the second division, or three months more in default of the payment of his fine.

His case supplies an authentic record of facts pointing to the necessity for heavier penalties being made possible in such cases, for the particulars disclosed proved the magnitude and the profits of trade. The conviction of Humphrey should show his fellows that the vigilance of the police, in spite of obvious difficulties in their way, cannot always be evaded, but the punishment may not deter persons from taking the risk. The goods forwarded by Humphrey were obtained from dealers in France, of which the French Government will presumably take cognisance. Somehow the police in China had information of a shipment which led to the arrest on board ship at Hong-Kong of a Japanese named Tieuw, who in due course received a sentence of imprisonment. Under his control there were found cases which contained certain furniture, two sofas and four armchairs, in the upholstery of which were concealed 2500 oz. of cocaine and 2400 oz. of morphine, estimated by counsel as representing 4,375,000 and 2,100,000 doses respectively. In England intercepted correspondence to and from Humphrey expressed the regret of both parties for the misfortune of Tieuw, knowledge that their documents had been seized, and of the consequent necessity for a new code, and the willingness of Humphrey to conduct fresh business. He offered to procure and ship a quantity of cocaine, said to be equivalent to 87,500,000 doses, which he suggested could be sold in China at 48*s.* per oz. to realise an estimated profit of £79,000, with a possibility of sale at a price as high as 200*s.* per oz. In an early contract quoted Tong Say had agreed to purchase from Humphrey not less than 1000 lb. per annum. It is not to be wondered that the Chinese Government is anxious to stop such a trade or that persons can be found to conduct such illicit retail.

The police of both countries are to be congratulated upon the capture of Humphrey, but the suppression of such traffic must depend upon the deterrence of unscrupulous individuals by heavier penalties, and upon the activity of the Government of the countries where manufacture takes place.

TUBERCULOSIS.

The Late Results of Sanatorium Treatment.

Prof. F. Reiche,[1] chief of the General Hamburg-Barmbeck Hospital, has lately published statistics showing the results of sanatorium treatment 17 years or more after discharge. The patients belonged to the insured class, and, thanks to the coöperation of the insurance officials, Prof. Reiche was able to trace most of his old patients, in spite of the length of the interval since their discharge. There were 1866 patients given sanatorium treatment for pulmonary tuberculosis in the period 1895–1904. It was found that in 1921—i.e., after an average interval of 22 years—46·9 per cent. were still perfectly fit for work, 18·2 per cent. were invalids, and 35·2 per cent. were dead. Many of the deaths were due to causes other than tuberculosis. All the patients were examined by Prof. Reiche in person, and he is sure that only very few could have been swept into the sanatorium net without being tuberculous. But quite a half of the total number of cases represented slight and early forms of the disease, and in as great a proportion as 24 per cent. two courses of sanatorium treatment were given, and in 7 per cent. three such courses were given. With these encouraging statistics for his text, Prof. Reiche urges the importance of institutional treatment for the tuberculous.

New York's 1922 Tuberculosis Death-rate.

New York has again established a record for a low tuberculosis death-rate. In 1922 this death-rate was 99 per 100,000 inhabitants, and never before has it been below 100. In 1921 it was 103. In 1910 tuberculosis caused 13 per cent. of all the deaths in New York; in 1922 this figure was reduced to 8 per cent. In the *Bulletin* for January and February, 1923, of the New York Tuberculosis Association, in which these figures are given, the future of the tuberculosis campaign is discussed. Although the tuberculosis death-rate has been reduced in New York by 53 per cent. since 1910, the falling curve now shows a tendency to flatten out, and there are still more than 25,000 sufferers from tuberculosis in the city. In addition to the measures already in force, three others are advocated as a means to giving "a death-blow to tuberculosis." They are: (1) Pasteurisation not only of milk but of all dairy products such as cream (including ice-cream), butter, and cheese; (2) extension of the system of "nutrition classes" to all children found under-nourished in the schools; (3) the establishment of industrial health services by anti-tuberculosis institutions, especially dispensaries, and by other health agencies.

The Unreliability of a Single Pirquet Test.

To show how misleading a single Pirquet test may be in childhood, Dr. O. Wiese [2] has published the results of the tuberculin examination of 800 children between the ages 5 and 15, by his assistant, Dr. H.

[1] Beitr. z. Klin. d. Tuberk., 1923, liv., 210.
[2] Ibid., 1922, liii., 170.

Rennebaum. A positive reaction to the first Pirquet test with old tuberculin was obtained in 537 cases. Of the remaining 263 cases which gave a negative reaction, as many as 170, or 64·6 per cent., were induced to give a positive reaction by repeating the Pirquet test with old tuberculin, by substituting Höchst cuti-tuberculin or Merck's diagnostic tuberculin for old tuberculin, by combining old tuberculin with "perlsucht" tuberculin, or by giving intracutaneous injections of old tuberculin in various strengths. It is thus evident that a single Pirquet test is of comparatively little value if it is negative.

Fashions in the Diagnosis and Treatment of Tuberculosis.

A combined report,[3] dealing with the activities of 34 German hospitals in 1921, is an instructive mirror of the changes taking place in the attitude of the German medical profession both towards diagnosis and treatment. With regard to diagnosis, the fashion at present is to label almost every child of weakly constitution as a case of bronchial gland tuberculosis. A few years ago the diagnosis would have been anæmia, and it is perhaps an advance that this loosely formulated diagnosis is beginning to drop out of fashion. With regard to fashions in treatment, heliotherapy appears to have been practised only in 2 to 3 per cent. of all the cases of pulmonary tuberculosis. But the quartz-mercury lamp was used in 19 per cent. of the male patients and 21 per cent. of the female patients. Tuberculin probably enjoys greater popularity in Germany than in this country, and about 20 per cent. of the sanatorium patients were given some form of tuberculin treatment. The cutaneous and percutaneous routes are the most popular at present, and Ponndorf's and Petruschky's methods of giving tuberculin through the skin appear to be extensively adopted in general practice, as well as in institutions in Germany. As many as 12 of the 34 institutions had not practised artificial pneumothorax treatment in the year under review, and only about 7 per cent. of the patients in the second and third stages of the disease had been given this treatment. There were, however, certain sanatoriums in which up to 15 per cent. of the second- and third-stage patients were given lung collapse treatment. This practice of issuing a combined report of a large group of sanatoriums is one that might well be followed in this country; pooling knowledge and experience has a stimulating as well as a corrective effect.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Congress of Physicians in Bucharest.

AT the recent Congress of Rumanian Physicians, held in Bucharest, Prof. Jacobovici delivered an introductory address, in which he stated that the status of the medical practitioner was at present depressed to that of the artisan. Hence, he said, arose struggles for appointments, demands for a medical strike. Some medical men had been smitten with the desire of gain; an element of industrialism had entered certain curative institutions and sanatoriums owned by doctors, who united the functions of medical directors and hotel proprietors, their aim being insufficiently distinct. The whole range of medicine could not now be covered by one individual; the pathology and treatment of tuberculosis, of heart, intestinal and infectious diseases, of diseases of tissue change, and especially of nervous diseases, tended to become specialised. The delegation of nervous diseases to special departments was inevitable, but care must be taken to keep the latter in close touch with internal medicine.

Child-Suicide.

Dr. Bàlint, of Sibin, has published a record relating to 200 cases of child-suicide in Europe; he notes that 50 cases were collected by Ferriani, 49 by Siegert, and 42 by Deutsch, of Budapest. The various causes are classified as predisposing, exciting, and general; the most striking fact that emerges is that the children who destroy themselves are generally nearing the close of school-life. The stress of examinations appears to be the most important single cause, whilst punishment, or the fear of it, poverty, and unhappiness of the parents, all contribute a part. Children who commit suicide are seldom, or never, normal, but many of them are intelligent and well-disposed, with a fair prospect of usefulness in life. The chosen form of death differs in various countries; in Germany, for instance, drowning is most frequently selected; in Hungary poison is the commonest means of self-destruction.

[3] Ibid., 1922, liii., 459.

"Pathological Delirium."

The following case was lately described in the *Erdèlvi Orvosok Lapja* (Transylvanian Medical Weekly): A landowner at Bistritz was accused of attempting to murder a servant by firing at him with a revolver in the course of a quarrel. Defendant's counsel pleaded that the prisoner was not responsible for his act, as he had been drinking, and as a doctor had declared him to be suffering from "pathological delirium," in consequence of free indulgence in intoxicants. The prisoner was acquitted. A legal paper has condemned the judge's attitude, arguing that were a drunken man held not to be criminally responsible many crimes would frequently go unpunished, including murder and other serious offences against the person.

March 19th.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health Reform and Dail Earann: A Congress of Teachers.

AN important debate took place at the annual congress of the Irish National Teachers last week, when, by invitation of the congress, Sir James Craig, M.P., ex-President of the Royal College of Physicians, gave an address on the medical inspection of schools. An Act was passed in 1919 at Westminster making compulsory in Ireland the medical inspection of school-children, and regulations for the carrying out of the Act were adopted by the Local Government Board and approved by the Board of National Education. The Act, however, has only now been put in force, and the public requires education as to the necessity for it. Sir James Craig made an excellent case, and obtained the full sympathy of the national teachers, a body whose goodwill is essential for the successful carrying out of any system of school inspection. He also took the opportunity of pressing forward the demand for the establishment of a Ministry of Health in the Free State.

The debate following the address was of good service, as it showed that the teachers were fully awake to the importance of safeguarding the health of the young. The speech of Mr. Thomas Johnson, leader of the Labour party in Dail Earann, was specially important as laying down a definite health policy for his party. He said that the public required to be trained to these ideas, and should be told on every occasion, whether asking for national or local funds, what the country could afford, as the cost was going to be a very serious question. But the true wealth of the nation was to be found in the men and women of the nation, and here was a chance for a good investment. They must not economise in public health or in education, and he was glad that Sir James Craig had emphasised the necessity for a Ministry of Health, where he would certainly be supported by every member of the Labour party. The medical profession were, he added, much further ahead than the public, and they could safely follow the profession in their teaching.

The Ministry of Local Government has now made a statement, through a representative, to the *Freeman's Journal*, in which the sympathy of the

Ministry is avowed. "Practically all the matters referred to," said the representative of the Ministry, "are being examined by our experts, and the Ministry have taken steps to acquaint themselves fully with the conditions of legislation on health matters on the Continent and America . . . As regards the question of the central authority, it may be observed that the Ministry of Local Government at present included all the important functions of the Ministry of Health in England." The latter statement is erroneous, for the National Health Insurance Commission is not under the Ministry of Local Government, but in the department of the Minister for Finance.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

IT is announced that Surg. Rear-Admiral Alexander Maclean, D.S.O., will succeed Surg. Rear-Admiral William Bett, C.B., in the medical charge of the Royal Naval Hospital, Haslar.

ROYAL ARMY MEDICAL CORPS.

Maj. T. C. Lucas, half pay list, late R.A.M.C., is placed on ret. pay on account of ill-health contracted on active service.

Capt. C. J. H. Little to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Pathology.

Capt. A. A. B. Scott retires, receiving a gratuity.

TERRITORIAL ARMY.

Maj. J. C. Burton, having attained the age limit, is retired, and retains the rank of Maj.

The undermentioned relinquish their commns. and retain their rank: Capts. J. T. Samuel, E. W. Griffith, W. Alexander, A. F. B. Shaw, and O. C. O'Sullivan.

Capts. D. A. R. Haddon and J. E. G. Thomson resign their commns. and are granted the rank of Maj.

Lt. E. H. Ponder (late R.A.M.C., D. Force) to be Lt.

Second Lt. J. Smart (late The Cameronians) to be Lt.

General Hospitals: The undermentioned, having attained the age limit, are retired, and retain their rank except where otherwise stated: Lt.-Cols. J. Barlow and G. S. Middleton; Majs. R. H. Parry, J. H. Pringle, T. K. Monro, J. G. Andrew, J. B. McK. Anderson, J. K. Love, W. MacLennan, and H. Walker; Capts. D. Lamb, J. R. Riddell, R. S. Fullarton and J. Patrick (all granted the rank of Major); Capts. J. Hamilton, A. N. McGregor, A. B. Kelly, A. S. Tindal, D. W. Russell, J. Maclean, F. Macrae, E. Mackay, J. A. C. Macewan, J. D. Holmes, A. Fraser, D. Fyfe, J. G. Tomkinson, J. H. Martin, J. Laurie, R. B. Ness, J. McC. Johnston, J. Carslaw, J. Towart, J. Morton, A. A. Young, W. W. Christie, A. McLennan, E. G. Fortune, J. Gilchrist, A. H. Edwards, M. L. Taylor, J. Gracie, D. Watson, and C. Kerr (granted the rank of Maj.).

Supernumerary for Service with the O.T.C.: Lt. E. J. T. Thompson (late H.L.I.) to be Lt. for service with the Medical Unit of the Glasgow University Contingent, O.T.C.

TERRITORIAL ARMY RESERVE.

Capt. J. H. Wilkinson, having attained the age limit, is retired and retains the rank of Capt.

Capt. J. Browne, from General List, to be Maj.

Capt. E. D. Richards, from General List, to be Capt.

DEATHS IN THE SERVICES.

Inspector-General William Harris Lloyd, R.N., whose death on April 2nd, at the age of 87, we announced in these columns last week, was the oldest officer of his rank in the navy. Born in 1836, he qualified with the M.D. St. Andrews and the L.R.C.P.I. in 1856 and immediately joined the navy as a surgeon. He first saw service in the *Calcutta*, in which ship he took part in the China War during 1857–58, and was awarded the medal with clasps for Canton and Taku. In 1862, when serving with the flagship *Nile* in North America, he took charge of some yellow fever cases which had occurred in the screw sloop *Rinaldo*, and later became a staff surgeon. In 1866 he was appointed to the *Jason* in American waters. In 1870 he was appointed for special duty at Haslar, afterwards to Lisbon Hospital, and later to the Admiralty. In 1884 he was made Deputy Inspector-General of Hospitals and Fleets. At the International Congress of Medicine in London in 1881 he was secretary of the section of military surgeons, and in 1887 represented the Admiralty at the International Medical Congress at Washington. From 1888 to 1890 he was senior medical officer of the naval hospital at Hong-Kong, and from 1892 to 1895, with the rank of Inspector-General, he was senior medical officer at Plymouth Hospital. He was appointed honorary surgeon to Queen Victoria in 1894, an office which he has held under the succeeding sovereigns, and retired from active service in 1896. Inspector-General Lloyd married in 1870 Phoebe, a daughter of Lieutenant-General Vincent of the Bengal Army, by whom he had two daughters.

Correspondence.

"Audi alteram partem."

INTERNATIONAL PUBLIC HEALTH.

To the Editor of THE LANCET.

SIR,—The Second International Interchange of Public Health Officers, held under the auspices of the Health Section of the League of Nations and organised by the Society of Medical Officers of Health, having completed its course in Great Britain on April 10th, the visiting health officers are proceeding to Austria and Switzerland for further studies.

At the moment of departure the foreign delegates to this interchange are happy to avail themselves of the columns of THE LANCET in which to voice some expression of their appreciation of the magnificent opportunities for study which have been placed at their disposal, and of the courtesy with which all arrangements have been carried out. This is not the time to present a criticial analysis of the current health practice of England in detail. That will come when the delegates, after careful study of the extensive reports and documents with which they have been furnished, and a resurvey of their own notes in perspective, are in a position to hand in their reports to their respective governments. But at the present time the outlines of the composition are before them, and a sufficiently impressive picture it makes. What the visitors intend to refer to at present is not the public health system of Great Britain, but rather to the course of study which they have enjoyed the privilege of taking here. On this subject they are of one opinion, that it was wisely planned, and has been carried out in the most efficient and graceful manner, so as to set a standard for future interchanges of this nature which it will be difficult to maintain, and perhaps impossible to surpass.

The delegates feel that it will be impossible for them to thank by name the hundreds of officials who have contributed with unfailing courtesy and patience to their instruction and comfort, or even to mention the various government departments which have planned and contributed to the programme, or the voluntary organisations which have joined with the rest in their entertainment. Let us say to all of these earnest, public-spirited men and women, who spend their lives in the service of humanity, that they have given us freely of their best, that they have instructed our minds and have touched our hearts, and that we are grateful. The task remains to us to turn to the best account the effort which has been expended here in behalf of human welfare.

We are, Sir, yours faithfully,

ANTON SMOLA,
ERNST BREZINA,
Austria.

I. H. APERS,
G. F. TIMBAL,
Belgium.

Y. MASEK, *Czecho-Slovakia.*

MAX CHRISTIANSEN,
BENDIX POULSEN,
Denmark.

G. G. W. BORG, *Finland.*

E. F. EMÉRIC,
ANDRE CAVAILLON,
P. J. DE BOISSEZON,
France.

FERENCZ WOLF, *Hungary.*

ROCCO RONCA,
MARIO COLLINA,
Italy.

GORO KASHIDA, *Japan.*

ANDRES DIESEN, *Norway.*

K. KARAFFA-KORBUTT,
BRUNO NOWAKOWSKI,
STANISLAS STYPULKOWSKI,
Poland.

PETER STOENESCU
Roumania.

ALEXIS N. SYSSIN,
I. G. GELMAN,
L. GINZTON,
Russia.

NATHALIE NICOLAJEVITCH,
Serbia.

M. NORDMAN, *Sweden.*

ARTHUR M. STIMSON,
GROVER A. KEMPF,
U.S.A.

London, April 10th, 1923.

MEDICAL PHYSICS.

To the Editor of THE LANCET.

SIR,—We desire to bring before your readers our views regarding the teaching of medical physics in the later years of the curriculum. We understand that it is suggested in Edinburgh that the student might obtain some teaching of medical physics from the physiologist, some from the ophthalmologist, some from the laryngologist, &c., but we are of opinion that unless a definite course by a definite teacher, who is qualified to teach medical physics, is attended, and unless this is followed by a definite examination ad hoc, the subject would not receive the study and attention which it deserves. The information would be patchy, important points would inevitably be omitted, and the instruction would lack the consecutive and coherent character which is essential for an efficient course.

We are, Sir, yours faithfully,

ALFRED DANIELL, M.A., LL.B., D.Sc.,
DAWSON TURNER, B.A., M.D., F.R.C.P.E., M.R.C.P. Lond.,
WILLIAM GEORGE SYM, M.D., F.R.C.S.E.,
Examiners in Physics for the Triple Qualification.

Edinburgh, March 31st, 1923.

THE ADMINISTRATION OF ANTI-DIPHTHERITIC SERUM.

To the Editor of THE LANCET.

SIR,—May I be permitted, as one who has been for many years and still is responsible for the care of a large number of cases of diphtheria annually, to offer a few remarks on the two points connected with the treatment of that disease which have been discussed in your columns during the last fortnight? First, in respect of the intravenous injection of the antitoxic serum, of the superiority of which Dr. Poul Iversen, as you state in your annotation on p. 709, writes with such conviction. Judging by the results of experiments on animals the intravenous method should be the best. But has it been proved in practice to be so? Dr. Iversen does not help us to decide this point, for he gives no details of the therapeutic results of the cases he treated; he does not even tell us how many of his patients died; nor has he given any information as to the ages of the patients and the nature of the attacks. Apparently, however, the sole object of his paper is to show how the patients stood the injections.

Now if one thing is certain in respect of the antitoxin treatment of diphtheria it is that if patients are brought under treatment early—that is, on the first or second day—they nearly all recover and rarely suffer from complications. That result has been obtained by the method of subcutaneous injection and by the use of small and moderate doses. It would, therefore, appear to be quite unnecessary and, in view of the possibility of the occurrence of rigors and collapse such as are recorded by Dr. Iversen, even undesirable to employ the intravenous method in mild attacks. But it might be beneficial in severe cases, which are usually also late. The method was tried in a few such cases many years ago at the Eastern Hospital. I was not impressed with the results; nor was I impressed with the results of the series of 45 cases reported by Dr. J. Biernacki and Dr. J. C. Muir and the 20 reported by Dr. D. L. Cairns. There is certainly a practical objection—namely, the difficulty of getting the serum into a vein in the case of a resisting child who is suffering from a severe attack of diphtheria. In such cases the superficial veins are collapsed and empty, and it is anything but easy to get the needle into a vein and keep it there. Dr. Biernacki and Dr. Muir bore witness to the reality of this difficulty when they advocated the dissection of a vein under a general anæsthetic.

Secondly, as regards the question of dosage raised by Dr. Ker, while I am in agreement with him generally, I do not agree that the Ministry of Health are extravagant in recommending general practitioners to administer 8000 units in cases provisionally diagnosed as diphtheria. But as my colleague Dr. Frederic Thomson, of the North-Eastern Hospital, exactly expresses my views on the subject, I need not repeat the arguments he uses in his letter to you of March 31st. Dr. Ker states that an unreasonable dread of anaphylactic shock deters many practitioners from injecting antitoxin early. That is Dr. Ker's experience in Edinburgh, but it is not mine in London. I attribute the lack of early specific treatment to two causes, the delay in waiting for the results of a culture and the failure on the part of the patient or his friends to seek medical advice at a sufficiently early moment. Dr. Ker calls attention to the remarkable fall in the case-mortality of diphtheria which followed the introduction of serum treatment and was undoubtedly effected by very moderate and even actually small doses. It may interest him and your readers to know that so far back as July, 1896, Lord (then Sir Joseph) Lister pointed out the same fact in a letter which I have in my possession, wherein he was discussing the question of the necessity of increasing the strength of the serum supplied by what was then known as the British Institute of Preventive Medicine.

I am, Sir, yours faithfully,

E. W. GOODALL.

North-Western Hospital, Hampstead, N.W., April 9th, 1923.

To the Editor of THE LANCET.

SIR,—In your issue of April 7th I notice a reference to an article by the late Dr. J. Biernacki and myself on this subject made in 1904. In this it is inferred that we recommended the method. I have not the paper before me, and it was written many years ago, but I have a clear recollection that we were very doubtful, after trying it in a number of cases, whether it presented any definite advantage over the usual subcutaneous method, and we practically discontinued to use it at Plaistow Hospital. I had quite forgotten that we practised giving an anæsthetic to small children for intravenous injection, and I think it must have been in a very small number of cases. I cannot help thinking at any rate that a method presents grave drawbacks if it needs a general anæsthetic in a disease like severe diphtheria, where the blood pressure and output of urine are already seriously affected and where the danger of setting up vomiting is so grave. The intravenous method would have to show very decided superiority to make habitual general anæsthesia justifiable. Yet it is precisely in small children that the gravest cases occur.

I am, Sir, yours faithfully,

J. C. MUIR.

Whipps Cross Hospital, Leytonstone, E., April 9th, 1923.

SERUM DOSAGE IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—In reference to Dr. Claude Ker's note on this subject in your issue of March 31st, he has not taken into consideration the great differences there may be in the virulence of diphtheria in different places at different times. For the type of diphtheria present in Bristol from 1910 to 1921 doses of from 4000 to 10,000 units were in all cases sufficient to obtain arrest of the disease and disappearance of the membrane. In 1921 the type of disease suddenly altered and a type of disease arose in which the membrane still rapidly grew with the onset of great cervical œdema on giving these doses. This type was characterised by great œdema of fauces and neck and delayed formation of membrane, which frequently did not show itself until the third or fourth day, causing great difficulties in diagnosis, by which time the patient was moribund. The disease was highly infectious and many of the staff were attacked, with one death from acute toxæmia, in spite of injections totalling 30,000 units, of which 10,000 were given on the first day without influencing the disease. (These disasters are now avoided by Schick's method.) In fact, so great was

the alteration in the effect of the doses as usually administered that it was not until I had tried every kind of antitoxin on the market that I realised that the poor results of our usual doses were not due to inactive serum but to an alteration in the type of the disease. The case-mortality in this hospital has undergone three alterations since 1900: 1902–07, 6·4 per cent.; 1908–16, 4·8 per cent.; rising in 1922 to 8·2 per cent.

In this area the medical officer of health circulates all practitioners from time to time, advising the dosage which is based on the type of disease prevalent at the time. This is a far wiser plan than attempting to set standards for the whole country. The Memorandum of the Ministry of Health advocates too low dosage to arrest the type of disease still prevalent in this area, but happily now becoming less virulent. I consider that the great differences in dosage suggested by various authorities in various countries are accounted for by wide variations in virulence which may occur in this disease and has occurred during my own period of observation of the disease during the last 14 years. As regards Dr. Ker's statement that 2000 to 3000 units given in the first couple of days would produce a phenomenal fall in diphtheria mortality, our own cases here utterly disprove it for our present type of disease. Of the last 80 fatal cases in this hospital, 19 received doses of from 2000 to 10,000 units within the first 48 hours while awaiting bacteriological confirmation before admission, but these amounts were insufficient to prevent death. It is very unfortunate that an authority of Dr. Ker's eminence should be found suggesting small doses while many of us have been trying to persuade our medical brethren to give large doses. No doubt the doses suggested by him would arrest the type of disease now prevalent in Edinburgh and prevalent in Bristol from 1908 to 1921, but his doctrine would be utterly misleading if applied to the type of disease we have had here during the last two years, in which death frequently occurred within two or three days of the onset of the disease from an overwhelming toxæmia.

I am, Sir, yours faithfully,

B. A. PETERS,

Chief Medical Officer, Ham Green Hospital, Bristol.

April 6th, 1923.

BURIED RADIUM EMANATION TUBES.

To the Editor of THE LANCET.

SIR,—It is not likely that the claim of Dr. Walter Stevenson (THE LANCET, April 7th) that the use of small radium emanation tubes for medical purposes originated in Dublin will be seriously questioned. This idea has been adopted at various radium centres and the technique developed in such a way that the emanation may be concentrated in minute glass capillaries measuring no more than about 3 mm. long and 0·5 mm. diameter. Dr. Failla, of the Memorial Hospital in New York, has devised a piece of apparatus for this purpose which is little short of a triumph of experimental skill. By the use of emanation in this way, the risk of loss of radium is probably minimised, although accidents have happened in the past to glass vessels containing radium in solution. A further apparent advantage is that tubes of any desired strength or dimensions may be filled to meet clinical requirements. This is not possible if the available supply of radium is sealed into a number of platinum tubes arbitrarily graded in strength.

A few disadvantages of the method may be mentioned. The cost of the apparatus, its upkeep, and the personnel for its efficient working is considerable; the emanation tubes slowly decline in strength, and this makes the calculation of the dose a little tiresome. Dr. Regaud has thought it more useful to measure the quantity which he calls "l'émanation détruite" instead of the average strength of the emanation, though the latter appears more directly useful.

I think that these obvious pros and cons are readily granted by those who have practical experience in the subject. There are, however, some debatable points which it might be useful to mention briefly.

(*a*) *The Uniform Irradiation of a Tumour by the Surgical Introduction of Radio-active Tubes.*—I presuppose that it is desired to give each part the same dose, presumably the lethal dose. The question is, What are the best sources to use for this purpose? We must avoid point sources and sources giving easily absorbed radiation; here are two objections to the emanation capillaries. If platinum tubes of thickness 0·5 mm. are used, the bulk of the radiation is of a very penetrating character, and some approach to uniformity of irradiation is got by using a number of them suitably placed; purely geometrical requirements must, however, give way to what is possible surgically. The lack of uniformity of irradiation can be compensated to some extent by the external application of gamma rays, but it appears hardly possible to avoid the overdosing of the tissues in those zones which are in immediate contact with the tubes.

(*b*) *The Avoidance of Tissue Reactions of an Undesirable Nature.*—Dominici held that it was a good thing to avoid the actual destruction of the tissues irradiated, and he aimed at producing a reaction in the normal tissues of the host which would bring about the desired results; he was a strong advocate of gamma radiation. Lately Dr. Laborde has maintained that the rather violent changes induced in the tissues by the beta rays from the emanation capillaries is an argument against their use.

(*c*) *The Advantages of Using Sources of Constant Intensity.*—Advances in radium therapy depend not only upon a recognition of the forms of disease for which it is a suitable agent, but upon the quantitative way in which it is applied; the quantitative technique is perhaps just as difficult as that involved in the deep X ray therapy of the present day, and it might serve a useful purpose in radium therapy if there were some agreement among those interested in the surgical use of radium to use tubes graded in size and content, according to a definite scale. The quantities at different centres in ordinary use range roughly from 1 to 100 mg. of radium bromide, and if arbitrary quantities, say, 1, 10, 25, 50, and 100 mgm. were decided upon and placed in tubes appropriate in size to these contents, comparisons between the results of treatment at different centres would become simplified to some extent.

In the radium clinical investigation which is at present being conducted at different centres in Great Britain and Ireland under the ægis of the Medical Research Council the attempt has been made to do this.

I am, Sir, yours faithfully,

SIDNEY RUSS.

The Middlesex Hospital, London, April 9th, 1923.

ALCOHOL AND INSANITY.

To the Editor of THE LANCET.

SIR,—Dr. Sullivan refuses to differentiate between a concrete instance and an abstract principle. It is not of the smallest importance from the present point of view whether or not mental stress is a cause of insanity. Dr. Sullivan will not, I suppose, deny that there is *some* cause of insanity. Let us call it "*x*" and I will grant him that mental stress has no causal connexion with insanity. Then "*x*" stands for any and every cause of insanity except alcoholism, and the point at issue remains unchanged. In order to prove that alcoholism is not a cause of insanity, it is necessary to show (in addition to the facts originally adduced in your leading article) that "*x*" has not increased in proportion to the diminution in alcoholism. This neither Dr. Sullivan nor your leading article has made any attempt to do.

I am, Sir, yours faithfully,

Wimpole-street, W., April 9th. STANLEY WYARD.

INSANITY AND THE CRIMINAL LAW.

To the Editor of THE LANCET.

SIR,—In your admirable leading article on Insanity and the Criminal Law in THE LANCET of April 7th, you state that "a committee of the Medico-Psychological Association, which considered this question exhaustively in 1896, failed to find, within the period covered by its inquiry, any instance of miscarriage of justice." As I opened the discussion on this subject in 1894 at the annual meeting of the British Medical Association at Bristol, at which for the first time in the annals of the B.M.A. barristers and lawyers were invited to attend and join in the debate, and as the said committee was appointed on a resolution proposed by myself and seconded by the late Dr. Charles Mercier, may I be allowed to interpose?

The report you mention was strongly opposed by a minority, and the result of this opposition was, that a resolution was carried by a large majority—that the report be laid on the table. So that this report was never accepted by the Medico-Psychological Association. My one great objection to the M'Naughton ruling—apart from its unscientific determination—is that the evidence which experts are *allowed by some judges* to give in the criminal court is not sufficient to enable the jury to bring in a verdict of "Guilty, but insane." Yet in many cases a written opinion by the same or some other expert, who is not cross-examined after an examination of the condemned prisoner, is sufficient to save him or her from the scaffold. Justice which is now done the prisoner in the condemned cell was withheld from him in the criminal court. This is, to my mind, palpably wrong and should in some way be righted.

The question of diminished responsibility is a very important one and this question would be easy of solution if we had—like other countries—degrees of the crime of murder.

I am, Sir, yours faithfully,

April 6th, 1923. LIONEL A. WEATHERLY, M.D.

SYPHILIS OF THE MEDIASTINUM.

To the Editor of THE LANCET.

SIR,—Whilst duly appreciating Dr. F. G. Chandler's friendly criticism of my case, I feel bound to confess that some of the points he has raised as being typical of mediastinal sarcoma are not in keeping with the teaching of medical writers. More especially do I refer to the statement that in mediastinal sarcoma there is "no displacement of viscera." Practically all the authorities to whom I have gone for reference state that displacement is an early symptom and may assume very large proportions. With regard to the title of my paper, I should have used the terms "A Case of Aneurysm of the Aortic Arch in a Girl," had I not been impressed by the unlikelihood of such a condition in a young female. As it was, X ray examination almost suggested the presence of an aneurysmal dilatation. I also regret that a post-mortem examination could not be obtained.

I am, Sir, yours faithfully,

Doncaster, March 26th, 1923. HAROLD F. RENTON.

THE DISPENSING OF PRESCRIPTIONS.

To the Editor of THE LANCET.

SIR,—I have been interested in the subject of accuracy in dispensing referred to in letters recently appearing in THE LANCET and wish to add my testimony in support of the opinions expressed by the writers as to the necessity of this matter receiving more general attention under the Food and Drugs Acts. One of your correspondents rightly says "how many mistakes may be made through faulty drugs?" and pleads for a set of regulations similar to those which control the dairy. I think the powers we already possess are quite sufficient if they are properly used. An Islington paper, the *Daily Gazette*, of March 24th, records a successful prosecution for the sale of a certain compound drug which was not composed of the ingredients in accordance with the demands of the purchaser, inasmuch as the said compound contained potassium bromide to the extent of 20·3 per cent. in excess of the amount prescribed, and spir. ammon. aromat. to the extent of 28·6 per cent. in excess of the amount prescribed.

When in the Isle of Wight in the year 1913, a sample prescription was made up by six panel chemists, the sample being taken with a view to ascertaining how they would be made up, particularly as regards quantities of materials composing the mixture. The prescription was a very simple one, containing nothing but potassium iodide, glycerine, and water. The iodide cost then about 13*s.* 6*d.* a pound, and the glycerine about 1*s.* 3*d.* a pound. The results of the analyses showed that the drugs were genuine, but that the quantities supplied varied very considerably.

Sample.		Short in pot. iod. (per cent.).	Short in glycerine (per cent.).
(*a*)	was	3·75	10·96
(*b*)	was	9·25	6·03
(*c*)	was	16·5	27·3
(*d*)	was	11·75	12·92
(*e*)	was	6·0	2·7
(*f*)	was	3·5 per cent. in excess of pot. iod. and 29·5 per cent. in excess in glycerine.	

Such results show the need of making frequent investigation into the accuracy of the dispensing of drugs by chemists.

I am, Sir, yours faithfully,

J. P. WALKER,
April 5th, 1923. County Medical Officer, Isle of Ely.

L'AFFAIRE SPAHLINGER.

To the Editor of THE LANCET.

SIR,—Having read in your columns the opinions of several of my colleagues concerning Mr. Henry Spahlinger's antituberculous vaccines and sera, I beg to inform you that I have applied this method since 1915 to more than 250 patients. My reasons for not having published sooner the remarkable results obtained are as follows.

These specific remedies are extremely delicate and difficult to produce. They necessitate the simultaneous manufacture of a series of partial products of which the combination produces the necessary polyvalence in order to obtain a cure for tuberculosis. The supply of these sera and vaccines has often, partially or totally, failed by reasons of the war and financial difficulties. Had the public been aware of the favourable results obtained by the treatment, the visits and demand for the remedy would have rendered Mr. Spahlinger's work more difficult and delayed the manufacture. The antitoxic action of the sera and their polyvalence not only arrest tuberculosis in its acute forms, but also render possible the application of this treatment with success in the most advanced phases of the disease, and in cases in which any therapeutic intervention by methods previously known would have appeared hopeless. The curative effect of the vaccines, even of partial vaccines, in chronic forms of tuberculosis has shown itself extremely reliable.

Since, for want of funds, the sera and vaccines can no longer be prepared, and, owing to general indifference, there is a prospect of closing the laboratory (the continued activity of which involves the recovery and lives of a multitude of sufferers) I consider it now to be my duty to make known the results obtained by this method.

I am, Sir, yours faithfully,

DR. TH. STEPHANI.

Montana, Switzerland, April 6th, 1923.

THE OPERATIVE TREATMENT OF SEPTIC MENINGITIS.

To the Editor of THE LANCET.

SIR,—The correspondence which has taken place upon the above subject, although it may not have cleared up the more or less academic point at issue, has at all events focused attention upon the all-important necessity of early diagnosis and early surgical interference.

How far one clinician will rely upon early biochemical evidences of disease and how long another will await the advent of definite objective indications will, no doubt, depend largely upon what his previous teaching has been. Nothing which has been written in this correspondence has altered my opinion that there is in meningitis a stage when the exudate is "serous" and another when it is "purulent"; that the one is the forerunner of the other, the former condition being amenable to early operative treatment, the latter, except on rare occasions, being followed by a fatal result.

I have had occasion to criticise Prof. Holgar Mygind's statistics on a previous occasion and do not propose to discuss them again. I would suggest, however, that those in charge of aural clinics—for I am referring to otitic meningitis—tabulate all the cases passing through their hands during a period of 12 months, and then publish the chemical changes found in the cerebro-spinal fluid, the cellular content, the bacteriological findings, and the final results. If they adduce evidence contrary to my experience I shall ask them to allow me to sit at their feet and learn.

I am, Sir, yours faithfully,

Manchester, April 9th, 1923. WILLIAM MILLIGAN.

ALLOCATION OF PANEL PATIENTS.

To the Editor of THE LANCET.

SIR,—The injustice of not allocating insured patients, who will not take the trouble to choose a doctor, is shown by the following. In the town where I practise there are 22,641 patients on the panel, 2888 of these have chosen no doctor, and the grant for them (some £1400 per annum) is divided among the insurance practitioners according to the numerical strength of their panels. In the town is a "Dr. A," with a panel of over 4000; he is allowed to have an arrangement with "Dr. B" (although not his assistant or even his partner) to cover this excess, and the two are allowed to have a total list of 4500; they actually have 4700 odd as a total. These two practitioners will get, roughly, one-fifth of the £1400 per annum (£280) above-mentioned as their share, in addition to the grant for their actual lists. If these 2888 patients were allocated "Drs. A and B" could not possibly receive any of them, as their lists are already in excess.

I am, Sir, yours faithfully,

April 9th, 1923. PANEL PRACTITIONER.

ROYAL WEST SUSSEX HOSPITAL, CHICHESTER.—The excess of expenditure over income in 1922 was £564, compared with the deficit of £196 11*s.* 7*d.* during 1921. In their annual report the governors appeal to all newcomers in the district to support the hospital, and to all employed persons to join the employee's scheme and to give a weekly contribution of 1*d.* or 2*d.* The scheme introduced last year for private paying patients is said to be working satisfactorily. The hospital has been adopted by the General Nursing Council of England and Wales as an approved training school for nurses, and an extensive new curriculum for student nurses has been instituted. The private nursing branch has been discontinued owing to the small number of applications received, private nurses in the district being well supplied from other sources. Sanction was given to liquidate the deficit from the Trustees' Fund which, it was stated, now stands at £16,759. A committee has been appointed to consider means of increasing the income. In-patients during the year numbered 954, against 928 during 1921; out-patients 1020, against 1088; X ray patients 815, against 497. The work of the X ray department had so increased that an X ray sister has been appointed.

Medical News.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following candidates successfully passed the examination held at the termination of the seventy-first session (January to March, 1923):—

*A. G. Harsant (Duncan medal), *R. Briercliffe, *C. E. Cook, *H. de Boer, *E. W. Adcock, C. H. Han, A. C. Rebello, R. H. Simpson, H. C. Godding, C. de C. Martin, M. L. Dhawan, J. Wijeyeratne, F. S. T. Thomas, J. M. Ghosh, R. W. C. Kelly, W. J. Jameson, P. Walsh, S. A. Wilkinson, H. G. Stockley, A. H. Manfield, Miss N. R. Mucadam, E. V. Lupprian, K. S. Krikorian, B. Cross, A. C. Garewah, H. P. Hodge, E. D. Lindow, and V. Mathew Matthews.

* With distinction.

UNIVERSITY OF DURHAM.—A new degree of Doctor of Surgery (D.Ch.) has been instituted at this University. The degree will be granted to those who can offer evidence that after graduation they have complied with the following regulations:—

The candidate must be a registered medical practitioner, not less than 24 years of age.

He must devote three years, not necessarily consecutive, subsequently to obtaining a registrable qualification, to the study of surgery and ancillary subjects. One at least of the three years must be spent in the University.

The candidate must submit to the professor of surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine.

One year shall be devoted mainly to work in the departments of anatomy, physiology, pathology, and bacteriology.

Six months must be spent as resident surgeon in a recognised teaching hospital and six months in the study of surgery in a recognised medical centre.

Six months must be spent in surgical study abroad.

The examination shall consist of an essay on some surgical subject chosen by the candidate and approved by the professor of surgery, and a clinical, practical, and oral examination in the field of general surgery, including anatomy, physiology, pathology and bacteriology, operative surgery, bandaging, instruments, &c. Further particulars may be obtained from the Registrar at the University.

At the Convocation held on March 29th the following degrees were conferred:—

M.D. for Practitioners of 15 Years' Standing.—William H. I. Bathurst, Walter G. Edwards, and William O'Sullivan.

M.B., B.S.—Frederick J. Armstrong, Sydney Basham, Thomas H. Blench, John C. Boyde, Edward C. Brewis, Cecil J. Ceilan-Jones, William N. Douglas, Mary Douglass, Claude Fenwick, Clennell C. Fenwick, William Graham, Alec Hanson, Norman Harkness, Edward S. Kirkhouse, Ralph R. Scott, Ralph F. Tredre, Henry F. Wattsford, and Edward A. Welsh.

L.D.S.—Thomas W. Hogg, Julius H. Joseph, Alfred E. Pattie, Eric B. Phillips, John L. Reid, and Allen McLean Wilson.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations recently held the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—*Gordon Purdy, *Wilfred H. Anderson, *James W. Wallace, *George A. Cowan, Patrick K. Dixon, Douglas L. Hemmingway, Rudolf Schaffer, Cornelius J. N. Loubser, John A. MacDonnell, John Crawford, Agnes L. Kelly, Joseph Morris, Godfrey W. Garde, Anthony B. Monks, Ralph A. Webner, George R. L. Jordan, Howard St. George McKenny, Jerreth Horwich, George G. McFarland, Morris Sless, William D. Speedy, Robert G. F. Thompson, John G. Maguire, Pieter Coetzee du Plessis, John E. Beatty, James Craig, John L. Levingston, Herbert Birney, James L. Marshall, Alexander Hawthorne, Paul Douglas Piei, and Isobel G. Smith.

Part II., Medicine.—William S. Dixon, Reginald R. J. Brandt, Joseph A. Gaynor, Agnes McLaughlin, Samuel M. Geffen, Robert T. Jackson, Alice M. A. Downing, Wilfrid E. C. Wynne, Henry O'Donnell Burke-Gaffney, George F. T. Saunders, James A. MacDonald, Henry J. L. Murphy, Jack M. Gordon, Ely G. Copeland, Dorothy C. H. Dorman, Herbert Kohlberg, Robert S. McElroy, Bernard Morris, William E. Callanan, Margaret L. Cowan, Norah M. Gilcriest, Maria E. Wagener, Max Wulfsohn, Eileen A. Boyd, Samuel W. Jamison, Hyman S. Roseman, Johannes H. Stals, and Joseph C. Byrne.

Surgery.—*Jan Hendrik Rauch, *Agnes McLaughlin, Richard R. D. Crawford, Robert H. Micks, Victor O. McCormick, Harold Renton, Cecil A. V. Ovendale, David S. Spence, Reuben Lipschitz, William T. Hogan, Henry M. Martin, John C. St. George Earl, Joseph E. Deane, Jan Hendrik Hodgman, Nicolaas Jan Valkenburg van Druten, Alexander Bernstein, Mossy Jaffe, William L. Duncan, Thomas G. Wilson, Ely G. Copeland, John S. Glasgow, Ernest M. Landau, James V. Williams, Albert V. Wood, Margaret L. Cowan, John H. J. Stuart, Etienne R. Hafner, Frederick W. G. Smith, Hugh R. Brady, Harold Lewin, Jacobus F. van Staden, and John D. Watson.

Midwifery.—John S. Glasgow, Joseph E. Eliason, Lazarus Heyman, William L. Duncan, John Kalmanson, Eric C.

Downer, Samuel M. Geffen, Kathleen E. Hill, Max Wulfsohn, John McClelland, Richard C. L. Griffiths, Herbert Kohlberg, Israel Marin, Albert E. O'Donnell, Frederick W. G. Smith, Norman E. H. P. Williams, Louis MacSherry Bell, Frederick T. Easby, Henry O'Donnell Burke-Gaffney, James A. MacDonald, Alexander Hawthorne, Nicolaas Jan Valkenburg van Druten, Tobias Freedman, Robert A. O'Meara, Johannes H. Stals, Pieter Coetzee du Plessis, Charles W. J. Ingham, Solomon Narunsky, Harry Ruben, Joseph C. Byrne, Morris Cohen, Louis Harris, William T. Hogan, Gladys Weatherill, Martha Reid, Frederick G. Brown, Sylvia B. Wigoder, Charles R. Hillis, Albert V. Wood, Robert S. McElroy, Julius Kruger, and Cecil J. McQuillan. * Passed on high marks.

DIPLOMA IN PUBLIC HEALTH.

Part I.—Leon O. Vercueil, Ruth F. Flavelle, Mary M. O'Leary, Samuel G. Weldon, and Patrick M. J. Bobbett.

Part II.—Leon O. Vercueil, Ruth F. Flavelle, Samuel G. Weldon, and Mary M. O'Leary.

NAVAL MEDICAL COMPASSIONATE FUND.—The annual meeting of the subscribers to this Fund will be held at the Medical Department of the Navy, 68, Victoria-street, London, S.W., on Tuesday, April 17th, at 11.30 A.M., for the purpose of electing six directors.

CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.—An alteration is announced in the programme of this congress which will be held in Edinburgh on April 19th and 20th. It has been found impossible to issue any formal report as a basis for the main discussion on intrinsic dysmenorrhœa and its treatment. The subject will therefore be introduced by Prof. Blair Bell, Liverpool, while Dr. T. Watts Eden, Prof. Ewen Maclean, and Dr. R. W. Johnstone will follow with brief papers on special aspects of the question.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: FEVER HOSPITAL MEDICAL SERVICE GROUP.—A meeting of this group will be held at 1, Upper Montague-street, Russell-square, London, W.C., on Friday, April 27th, at 3.45 P.M. A paper will be read by Dr. W. J. J. Stewart on the Failure of the Isolation Hospital to Reduce the Incidence of Scarlet Fever; a Possible Explanation and Remedy, with a note on Diagnosis. Dr. M. O. Howell will communicate a report on a case.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next Congress of the Institute will be held at Scarborough from Wednesday, May 16th, to Monday, May 21st inclusive, under the presidency of Lord Riddell. The President will be supported by an imposing list of vice-presidents, including the Presidents of the English Royal Colleges, the director of the Royal Naval Medical Department, the chairman of the Metropolitan Asylums Board, and the mayors of a large number of metropolitan boroughs and provincial cities. The Mayor of Scarborough will preside over a general committee, composed of representative citizens of the locality. The proceedings will be divided into five sections—namely: (1) State Medicine and Municipal Hygiene; (2) Naval, Military, Air, and Tropical Diseases; (3) Bacteriology and Biochemistry; (4) Women and Public Health; and (5) Industrial Hygiene, and to the proceedings of these sections important communications have already been promised. All information with regard to hotel and travelling arrangements and railway tickets should be made to Dr. T. N. Kelynack at the office of the Institute, 37, Russell-square, London, W.C.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held jointly with the Home Counties Branch of the Society of Medical Officers of Health, on April 27th, in the Guildhall, Guildford, when a discussion on Things That Matter in Public Health will be opened by Sir Arthur Newsholme, followed by Sir Arthur Spurgeon, Dr. Andrew Balfour, Alderman Shawcross, Dr. G. F. Buchan, Dr. R. J. Ewart, Dr. A. Greenwood, Dr. W. W. Jameson, Dr. D. C. Kirkhope, Dr. A. Lyndon, Dr. A. B. McMaster, Dr. T. S. McIntosh, Dr. W. A. Muir, Dr. R. D. Smedley, and Dr. J. Watt. The chair will be taken at 6 P.M. by Dr. Louis C. Parkes. Those proposing to attend should notify the hon. local secretary, Dr. J. Cates, 5, Grove-crescent, Kingston-on-Thames, not later than April 20th.

The annual congress will be held at Hull from July 30th to August 4th. The inaugural address will be read by the President of the congress, Mr. F. R. Ferens, high steward of Hull, on July 30th. A lecture on a Pure Water-supply will be delivered by Sir Alexander Houston on July 31st. A Health Exhibition, illustrating municipal sanitation and domestic health and comfort, will be arranged, and visits to places of sanitary interest. The Council invite papers on health and sanitary science. Authors should forward the manuscript, which should not exceed 2000 words, as early as possible, in any case not later than June 25th, to the Secretary, the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1, from whom further particulars may be obtained. The hon. local secretaries are Mr. H. A. Learoyd and Dr. J. Wright Mason

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL AND RACIAL PROGRESS.—A meeting will be held on April 19th, at 8 P.M., at Essex Hall, Strand, London, W.C., when Mr. Charles E. Pell will give a lecture entitled "Is the Fall in the Birth-rate a Natural Law?" to be followed by a discussion. Those interested are asked to apply to the hon. sec. of the society, 7, John-street, Adelphi, London, W.C. 2.

NO. 55 GENERAL HOSPITAL.—The annual reunion dinner will be held at the Trocadero Restaurant on Saturday, May 12th, at 7 for 7.30 P.M. The matron and nurses are holding a reunion tea at the United Services Club, 34, Cavendish-square, at 4–6 P.M. on the same day, to which all officers are invited. Those intending to be present are asked to notify Dr. H. B. Roderick, 17, Trumpington-street, Cambridge, as soon as possible.

LADIES' MEDICAL GOLFING SOCIETY.—The spring meeting was held at West Hill golf course on April 6th. The Canny Ryall Challenge Cup was won by Mrs. Max Page with a score of 92 − 10 = 82. Miss M. Gourlay won the scratch prize with a score of 88. Miss E. Leitch won the senior handicap with a score of 89 − 6 = 83, and with Mrs. Lamplough the foursomes against bogey (2 down). Miss McIlroy (18) won the junior handicap after a tie with Mrs. Sherwill Dawe (20), with a score of 88.

ST. BARTHOLOMEW'S HOSPITAL WAR MEMORIAL FUND.—At a recent meeting of the Council of the Medical College it was decided to open a subscription list towards the memorial for St. Bartholomew's men who lost their lives during the European War. The exact form which the memorial should take has not yet been decided upon, but it would in any case include a tablet on which the names would be recorded. A provisional list has been drawn up and circulated in order that any mistakes or omissions may be rectified. The preliminary list of subscriptions includes a sum of £1000 from the medical staff of the hospital. Any who wish to subscribe are asked to send their contribution to Mr. W. Girling Ball, hon. secretary, 77, Wimpole-street, London, W. 1.

LANDOUZY MEMORIAL MUSEUM.—On March 22nd the Landouzy Memorial Museum was officially opened, the ceremony taking place in the council room of the Faculté de Médecine. Most of the professors of the faculty were present, and many offered grateful tribute to the late doyen of the French medical profession. His successor, Prof. G. H. Roger, referred to the time, now happily remote, when Landouzy's views on the prevalence of tuberculosis were the subject of incredulous scoffing. His opinion that almost every obscure case of pleurisy was due to tuberculosis gave him the reputation for seeing tuberculosis everywhere. To which accusation he would retort: "But it is everywhere." Other speakers dealt with other aspects of Landouzy's career—his gift for organisation, his clinical acumen, his patient kindness. But always, or nearly always, they came back to his work on tuberculosis, and his labours on behalf of the "tuberculosis casualties" of the war were referred to more than once. The medal struck in commemoration of Landouzy bears the words: Quid medicus possit vita verboque docebat.

THE DISPENSING OF PRESCRIPTIONS IN SALFORD.—A report issued by Mr. G. D. Elsdon, borough analyst of Salford, records the success achieved in Salford by the superintendence of dispensing under the Insurance Act. For many years past mixtures based upon prescriptions written on the private notepaper of medical practitioners have been analysed in Salford. In 1916 a clause was inserted in the terms of service under the Insurance Act for persons supplying drugs and appliances, which stated that:

"All drugs and appliances shall be supplied to the person presenting such order as aforesaid free of charge to that person. Provided; nevertheless, that the pharmacist shall sell to any one of the persons mentioned in Section 13 of the Sale of Food and Drugs Act, 1875, or to any person authorised by such person at the price usually charged to private customers any drug or medicine prescribed or specified on the appropriate prescription form provided by the Committee for the use of insured persons and signed by an insurance practitioner."

In 1918 arrangements between the Salford Insurance Committee, the Salford Health Committee, and the Pharmaceutical Association were made for the taking of samples on Insurance Act prescription forms. It is important to decide what degree of accuracy it is reasonable to expect, and in Salford it has been mutually agreed that the strength of prescriptions should not differ by more than 10 per cent. from the truth, except in such cases as sodium bicarbonate, when 15 per cent., or thereabouts, was accepted. In the case of potent drugs, however, it was insisted that a 10 per cent. error was too great. The public analyst reports to the Insurance Committee as well as to the Health Committee, so that either or both may institute legal proceedings should it deem fit.

THE address of the Medical Defence Union has been changed to 49, Bedford-square, London, W.C. 1.

Sir David Wallace, K.B.E., C.M.G., F.R.C.S., has been appointed a deputy lieutenant for the county of the city of Edinburgh.

PRECAUTIONS AGAINST SMALL-POX AT NELSON.—In consequence of the outbreak of small-pox at Nelson—up to the end of last week 49 cases have been reported—the managers of public entertainments and the local kinema houses have agreed to close their establishments. The Sunday schools also will be closed.

MANCHESTER HOSPITALS.—The Manchester and Salford Hospital Saturday and Convalescent Homes Fund and district joint committees last year collected £15,882, an increase of £1000 on the previous year. The increase was due to the penny-a-week scheme, which the chairman described as the solid rock foundation of the Hospital Saturday Fund. Since its institution in 1907 the Fund has provided £83,600 for the hospitals.

DONATIONS AND BEQUESTS.—The late Mrs. Frances Brown, of Clapton-square, Clapton, N.E., has left by will, among other bequests, £5000 to King Edward's Hospital Fund for London, for the use of such London hospitals as may be most in need of it; £5000 to the London Hospital; £5000 to St. Bartholomew's Hospital; £2000 to Addenbrooke's Hospital, Cambridge; £1000 to Dr. Barnardo's Homes; £1000 to St. Dunstan's Hostel for Blinded Soldiers.

THE LATE DR. DANIEL BALDING.—Daniel Barley Balding, who died on April 8th at Royston, Herts, at the age of 92 years, studied medicine at the Middlesex Hospital, qualifying L.S.A. in 1852 and F.R.C.S. Eng., 1858. He became resident medical officer at his hospital and maintained throughout life a keen interest in its doings, contributing notes on the Hospital Reports to our columns. He was on the Commission of Peace for the counties of Cambs and Herts, and had acted as coroner for Hertfordshire for 40 years.

CITY OF LONDON MENTAL HOSPITAL.—In the annual report for 1922 of this hospital, which is situated at Stone, near Dartford, it is recommended that two clauses relating to the hospital should be inserted in the next General Powers Bill of the Corporation of London. The first of these is to authorise the use of the term "mental hospital" in describing the institution for legal and official purposes; the visiting committee "believe that they are only voicing a general feeling throughout the country that the description 'asylum' should be dropped in connexion with institutions for the mentally afflicted." The second is to empower the institution to receive voluntary boarders; many applications for the admission of voluntary boarders are received, and have at present to be refused. A noteworthy feature of the report concerns the practice of allowing unusually large numbers of patients out on trial and on parole. A considerable amount of anxiety and trouble is thus involved, but the pleasure and gain to the patients are such that 86 have been allowed out on parole this year, and a number of others have been given leave of absence, not only to test fitness for discharge, but in some cases to give them the benefit of a change during remissions in their illness.

A TOUR OF THE ITALIAN SPAS.—An opportunity will be afforded at the end of next month for a group of English medical men to visit a selection of the Italian spas. The departure from London will take place on May 29th, and the arrangements on the British side are in the hands of Major W. Stormont, Italian State Railways and State Tourist Department, 12, Waterloo-place, London, S.W., from whom all details can be obtained. The tour, which will last a fortnight, is being organised in connexion with the Italian medical authorities; it will start at Acqui, just north of Genoa, and will include San Pellegrino, Sirmione, Levico, Roncegno, Salsomaggiore, Montecatini, Fiuggi, and Agnano, next to Naples. Incidentally the tour will take the travellers through Milan, Florence, and Rome on their way south. Owing to the generosity of those concerned the train and hotel accommodation from beginning to end will cost only about 12 guineas, to which sum will have to be added another 12 guineas, or so, for the journey between London and the starting-point. The Italian spas are not at all well known to English medical men, and the opportunity is one therefore that should be taken by those particularly interested in balneological treatment. The most lovely season of the year has been selected for the tour, and arrangements have been made for Italian medical men with a knowledge of English to accompany the travellers.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Defeat of the Government.

THE Government suffered defeat in the House of Commons on Tuesday evening, April 10th, after a discussion on the motion that "the Speaker do now leave the Chair" on the House going into Committee of Supply on the Civil Service Estimates.

HOUSE OF COMMONS.

MONDAY, APRIL 9TH.

Dangerous Drugs and Poisons Bill.

On the motion for the third reading of the Dangerous Drugs and Poisons (Amendment) Bill,

Mr. SIDNEY WEBB said he had been asked by a number of medical practitioners to bring several points to the notice of the Home Secretary in connexion with the measure. There had been considerable advances made in the knowledge concerning drugs and poisons since the Poisons and Pharmacy Act, 1868, was passed. He suggested that it might be possible to draw up a revised schedule of these substances with the advice of the Royal Colleges of Physicians and Surgeons in the light of the latest chemical knowledge available. He also called attention to the powers taken under the Bill to deal with acts which might not be crimes under British law, but might be made punishable under the law of other countries. He thought that this was stretching our system of jurisprudence rather far. While he did not suggest that anything dreadful was going to happen under this provision it seemed to him to be opening the door rather wide.

Sir SYDNEY RUSSELL-WELLS said that he was convinced that the provision with regard to offences under the law of foreign countries was absolutely necessary if conventions were to be entered into with other nations for the suppression of what was undoubtedly a pernicious practice. He thanked the Home Secretary on behalf of the medical members of the House for the way in which he had treated the representations they had made to him on this measure. He thought that Mr. Bridgeman had realised they were anxious to help in carrying out the objects of the Bill. He thanked the right hon. gentleman for removing the provision which prevented medical men from prescribing these drugs for themselves. They had been able to convince the Home Secretary that the provision would occasion inconvenience and hardship and all sorts of anomalies, and would not be likely to effect the object in view.

Mr. BRIDGEMAN (Home Secretary) said that he was taking steps to withdraw the regulations referred to by the hon. Member. As to the question of a revised schedule raised by Mr. Sidney Webb, the schedule made up under Section 2 of the original Act was brought down to 1908. On the advice of the Pharmaceutical Society it would be possible to add other drugs to the schedule if it was found necessary. In reply to Mr. Webb's point about laws passed in other countries, Mr. Bridgeman said that the agreement signed at The Hague on Jan. 23rd, 1912, should do away with any apprehension that foreign countries might pass some law which we should be obliged to observe.

Mr. G. C. CLAYTON asked the Home Secretary to make the same concessions to licensed wholesale druggists as he had made to the medical profession and the Pharmaceutical Society. At present they were liable to the same penalty as illicit drug dealers.

Mr. BRIDGEMAN said that that point was raised in Committee, and on that occasion he gave reasons why he could not agree to reduce the penalty for a breach of the licence far below what he thought was necessary.

Lieut.-Colonel FREMANTLE said that this was not "stunt" legislation; he only wished it were. But they were faced with a very serious danger. The drug traffic was a subtle, insidious influence which was sapping the vitality of individuals met with in ordinary life. The long-standing trouble between the medical profession and the makers of patent medicines was removed by the provisions of this Bill. The claim of the profession that the ingredients of patent medicines should always be given was opposed by the makers on the ground that it would not be in the interests of British trade to reveal trade secrets. Both claims were satisfied, and the public interest met by the provision that in patent medicines containing a dangerous drug the proportion of that drug must be stated on the bottle.

Dr. CHAPPLE said that the Bill dealt with only one-tenth of the evils of the drug traffic. He urged the Government to complete their work by bringing in legislation on the basis of the report of the Committee on Patent Medicines, which was presented in 1914.

The Bill was read a third time.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, April 17th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Cases:
The following will be shown by:—
Mr. C. Max Page: Cases of Muscle Sliding Operation on Forearm.
Mr. P. Bernard Roth: (1) Case of Renal Dwarfism after Operation for Genu Valgum. (2) Case of Ocular Torticollis.
Other cases will be shown.

Wednesday, April 18th.

HISTORY OF MEDICINE: at 5 P.M.
Papers:
Dr. A. T. Davies: Thomas Davies, M.D., and His Work.
Mr. R. Campbell Thompson: Assyrian Medical Texts in the British Museum.

Thursday, April 19th.

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.)
Cases will be shown.

Friday, April 20th.

OTOLOGY: at 5 P.M. (Cases at 4.45 P.M.)
Communication:
Mr. E. D. D. Davis: The Morbid Anatomy and Drainage of Otitic Meningitis (with specimens).
Cases:
Sir James Dundas-Grant will show cases of Deafness with History of Injury.
Cases will be shown by Dr. Dan McKenzie and others.

ELECTRO-THERAPEUTICS: at 8.30 P.M.
Short Papers:
Dr. Salmond: A Case Illustrating the Use of Pneumo-pericardium.
Mr. Hart and Mr. W. Whately Smith: A New Apparatus for Measuring Sensori-motor Reaction Times.
Other papers will be read.

ANÆSTHETICS: at 8.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1923–24.
To be immediately followed by an ordinary meeting at which Dr. J. H. Chaldecott will open a discussion on Coroners' Inquests: The Classification of Anæsthetic Deaths as Violent or Unnatural. Members of the Coroners' Society and the Medico-Legal Society have been invited to attend and take part in the discussion.

LONDON DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.
TUESDAY, April 17th.—4.30 P.M., Specimens and Cases. 5 P.M., Dr. R. Prosser White: Fur Dermatosis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.
MONDAY, April 16th.—5 P.M., Prof. Shattock: Specimens Illustrating Repairs of Fractures.
FRIDAY, 5 P.M., Sir Arthur Keith: The Shape and Relationships of the Stomach.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, April 16th.—10 A.M., Mr. MacDonald: Genito-Urinary Dept. 3 P.M., Mr. Simmonds: Surgical Out-patients. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks Davis: Nose, Throat and Ear.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2.30 P.M., Mr. Donald Armour: Visit to Surgical Wards. 3 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Flett: Radiology. 3 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10.30 P.M., Mr. Maingot: Surgical Pathology.
Daily 10 A.M. to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients and Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
(Demonstration of Clinical Cases at 3.30 P.M.)
MONDAY, April 16th.—Medical: Dr. J. Browning Alexander.
TUESDAY.—Surgical (3 P.M.): Mr. Howell Evans.
WEDNESDAY.—Eye Cases: Mr. Norman B. B. Fleming.
THURSDAY.—Surgical: Mr. H. W. Carson.
FRIDAY.—Diseases of Children: Dr. C. E. Sundell.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, April 19th.—5 P.M., Mr. L. Phillips: The Scope of Cæsarean Section.

UNIVERSITY OF BRISTOL POST-GRADUATE DEMONSTRATIONS (in the Medical Theatre).
THURSDAY, April 19th.—3.30 P.M., Mr. E. R. Chambers: Common Forms of Conjunctivitis.
FRIDAY (at Dorchester).—Dr. Hadfield: Diagnostic Value of Cerebro-spinal Fluid Examinations.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, April 17th.—4.15 P.M., Dr. J. M. W. Morison: Radiography of the Chest and its Limitations.
FRIDAY.—4.15 P.M., Mr. W. R. Douglas and Dr. J. M. W. Morison: The Diagnosis and Surgical Treatment of Lesions of the Large Intestine.

SALFORD ROYAL HOSPITAL.
THURSDAY, April 19th.—4.30 P.M., Mr. A. Smalley: Emergencies of the Ear, Nose and Throat.

Appointments.

BARRON, H. THOMPSON, M.D. Lond., M.R.C.S., L.R.C.P., has been appointed Hon. Physician in charge of the Skin Department of the Royal Waterloo Hospital for Children and Women.

ROWAN, H., M.B., B.S. Lond., Registrar to the Kensington, Fulham, and Chelsea General Hospital, S.W.

Manchester Royal Infirmary: MITCHELL, W., M.B., Ch.B. Manch., and SMITH, E. P., M.B., Ch.B. Manch., Clinical Assistants.

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—H.S. and Asst. H.S. £175 and £130 respectively.
Birmingham and Midland Homœopathic Hospital and Dispensary.—Res. H.S. £175.
Bradford Royal Infirmary.—H.S. £150.
Brentwood Mental Hospital, Brentwood, Essex.—Jun. Asst. M.O. £510.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Bristol General Hospital.—Hon. Asst. P.
Cancer Hospital, Fulham-road, S.W.—H.S. £100.
Carlisle Union, Fusehill Institution.—M.O. £250.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £125.
Colchester, Essex County Hospital.—H.P. £200.
Delamere Forest, Cheshire, Crossley Sanatorium.—Asst. M.O. £250.
Derby Isolation Hospital and Sanatorium.—R.M.O. £400.
Dover, Royal Victoria Hospital.—H.S. £180.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. £125.
Female Lock Hospital, 283, Harrow-road, W.—Clin. Asst. £100.
Gloucestershire Royal Infirmary.—Hon. Radiologist.
Great Indian Peninsula Railway.—Dist. Surg. Rs.700 a month.
Hôpital Français, 172, Shaftesbury-avenue, W.C.—Second Res. M.O. £100.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. £50.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Clin. Asst. M.O. in Venereal Dept. £1 1s. per visit.
Kensington Dispensary and Children's Hospital.—R.M.O. £150.
London County Mental Hospital Service.—Seventh Asst. M.O. £440.
London Homœopathic Hospital, Great Ormond-street, W.C.—Third Anæsthetist. £50.
Maidstone, Kent County Ophthalmic Hospital.—Res. Surg. O. £750.
Manchester Royal Infirmary.—H.P.'s and H.S.'s. Each £100.
Manchester, St. Mary's Hospitals for Women and Children.—H.S. £50.
Metropolitan Hospital, Kingsland-road, E.—Cas. O. and Res. Anæsth. £120. Sen. H.P. and H.S. £100. Also Asst. H.P. and H.S.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Out-patient M.O. £125.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.
Nottingham, Children's Hospital.—R.H.P. £150.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £125.
Rotherham Hospital.—Sen. H.S. £250.
Royal Free Hospital, Gray's Inn-road, W.C.—Gynæcological Reg. £250.
Stretford Urban District Council.—M.O.H., &c. £750.
University College Hospital, Gower-street, W.C.—Res. M.O. £150.
West London Hospital, Hammersmith-road, W.C.—Hon. Med. Radiologist.
Whittingham County Mental Hospital, nr. Preston, Lancs.—Pathologist and Asst. M.O. £440 17s.
Worcester County and City Mental Hospital, Powick, near Worcester.—Jun. A.M.O. £300.
York, North Riding Mental Hospital, Clifton.—Deputy Supt. £500.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments at Ryde, Isle of Wight, and at Ulverston, Lancaster.

Births, Marriages, and Deaths.

BIRTHS.

DALLIMORE.—On March 28th, at The Limes, Edgeley-road, Stockport, the wife of Dr. F. Dallimore, of a daughter.

GOFFE.—On April 5th, at 10, High-street, Kingston-on-Thames, Edna M. Powell, M.B., B.S. Lond., D.P.H. Camb., the wife of E. G. Leopold Goffe, M.D., B.S. Lond., of a son (Michael).

HAYNES.—On April 7th, at Brentwood, the wife of Lieut.-Colonel H. G. L. Haynes, R.A.M.C.(T.), of a son.

MCELLIGOTT.—On April 3rd, to Drs. Geraldine and E. T. McElligott, Eltham, S.E. 9—a daughter.

MIDDLEMISS.—On March 31st, at Settle, Yorkshire, the wife of Dr. G. W. Middlemiss of a daughter.

MILLIGAN.—On April 6th, at Woodlands-road, Ansdell, Lytham, Lancs, the wife of W. E. Milligan, M.B., B.S., of a daughter.

MARRIAGES.

BURRELL—RYAN.—On April 7th, at St. Mark's, Little Common, Sussex, Ellis Morgan Burrell, M.A., M.B., B.Ch. Cantab., of Knutsford, Cheshire, to Helen Madge, youngest daughter of Mr. John Ryan, O.B.E., and Mrs. Ryan, St. Thomas'-mansions, S.E., and "Mascot," Cooden Beach.

RAYNER—HARDING.—On April 4th, at St. James's Church, Myatt's Park, S.E., Howard Luscombe Rayner, M.B. Oxon., to Kathleen Doris, only child of Mr. and Mrs. H. J. C. Harding, of Calais-gate, Myatt's Park, S.E.

REA—WADDELL.—On April 4th, at Shawlands U.F. Church, Glasgow, Robert Lindsay Rea, F.R.C.S., Harley-street, W., to Mary Eleanor, daughter of the late Mr. James Waddell, Glasgow.

SHELSWELL—CRAMPTON.—On April 4th, at the Parish Church, Hampstead, Arthur Hugh Shelswell, M.R.C.S., L.R.C.P., to Eileen, only daughter of Mrs. Crampton, of Hampstead, and the late Dr. T. Hobbs Crampton.

TAGGART—SPICKETT.—On April 7th, 1923, Hugh J. Taggart, B.A., M.B., B.Ch., D.O.M.S., of 34, Central-avenue, Hayes, Middlesex, to Frances M. Spickett, M.R.C.S., L.R.C.P., M.B., B.S., of the South-Western Hospital, Stockwell, London.

DEATHS.

MACLEAN.—On April 3rd, at Swindon House, Swindon, Wilts, after a short illness, John Campbell Maclean, M.B., C.M., in his 78th year.

YEATS.—On April 4th, at Oakhurst, Romiley, Cheshire, William Yeats, M.D., M.B., C.M., &c. (late of Manchester), aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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THE PRINCIPLES AND PRACTICE OF HEALTH LEGISLATION.

Abridged from a Public Lecture delivered under the auspices of the Chadwick Trustees, in the Inner Temple Hall, on March 12th, 1923,

BY CHARLES PORTER, M.D., B.SC., M.R.C.P. EDIN.,

OF THE MIDDLE TEMPLE, BARRISTER-AT-LAW; MEDICAL OFFICER OF HEALTH, METROPOLITAN BOROUGH OF ST. MARYLEBONE.

LOOKING at health legislation administratively it is possible to see it as something other than law pure and simple. Dealing with it we are in fact not dealing with *health law* but with the *laws of health*, which have as their sanction not the fines and imprisonment that the law talks of and the courts may impose, but injury to health, sickness, disease, and even death, penalties that the law does not mention, but that a court higher than the highest of our courts may exact.

The measures containing these rules are very numerous: not because the rules themselves are numerous, but because they have to be applied in a variety of ways to a number of different matters. The bulk of these measures are comparatively recent; few of them go back much beyond 1875—rather less than 50 years ago—and most of them had their origin in Acts of Parliament not yet 100 years old. This does not mean that nothing in the way of health legislation was thought of or promoted and passed before that time. Nor does it mean that hygiene is an entirely new subject and that the earlier doctors or governments had not thought of preventing disease or of laying down laws of health. All it does mean is that it was not considered possible to apply health rules for the benefit of a mass of individuals, since local government in the communities was not sufficiently organised and there was no one to see that the rules were adopted and applied.

Principle of a Central Organisation.

In this country the need for an organisation in connexion with the application of the laws of health and as a preliminary thereto, was one of the first things to be recognised when the health conscience awoke and what may be called the real era of health legislation began. This may be regarded as the main principle underlying the whole of our health legislation, and of its soundness there can be no question. That it was adopted and adhered to is, to my mind, one of the reasons why our health scheme is superior to that of any other nation in the world. Like so much that is good in the sphere of public health, we owe thanks for it to Chadwick, a social reformer, and to Sir John Simon, the first real practitioner of preventive medicine this country ever saw. These two were the architects, and to a large extent the builders, of the system now in operation.

Having recognised the first broad principle—viz., the necessity for setting up an organisation, and, more important still, having brought others to recognise it, how did Chadwick and those with him proceed to establish it? The recognition of other principles was involved, the chief of these being that the need for organisation would not be properly met unless such as was set up was in intimate contact with the place where the health legislation was to operate. To have this properly grasped was a task of considerable difficulty, but as may be gathered from the legislation itself it was ultimately accepted. For proof of this it is necessary only to turn to the Public Health Act, 1848, which was the first Act bearing this name to be passed. Described as an "Act for Promoting the Public Health" its objects were set out in the preamble as follows:—

> "Whereas further and more effectual Provision ought to be made for improving the sanitary Condition of Towns and populous Places in England and Wales, and it is expedient that the supply of water to such Towns and Places, and the sewerage, drainage, cleansing, and paving thereof, should, as far as practicable, be placed under one and the same local management and control, subject to such general supervision, as is hereinafter provided: Be it therefore enacted"—and so on.

In this it will be noted that, in addition to referring to local management and control, there is reference to a need for "general supervision."

General and Local Boards of Health.

The body charged with this general supervision was to be known as the "General Board of Health" and was to consist of the First Commissioner of Woods and Forests and two other persons appointed by Royal Warrant. This body had power to appoint various officers and servants and "superintending inspectors"; its existence, however, was limited to five years. As a matter of fact it lasted about

ten years, but speaking generally it does not appear to have been liked. The whole Act, indeed, encountered a great deal of opposition, both before and after it was passed, some of those who opposed it doing so from dislike of the General Board of Health; others mainly because they objected to the provisions as to the setting up of local boards of health which involved, under certain conditions, the imposition of the body upon the locality and also, if they happened to be property owners, because they feared interference by the officers whom the Board was given power to appoint. The ostensible reason for objecting to the General Board of Health was that in regard to it there was a violation of principle in that it was not a representative body but consisted or might consist of paid officials. The real reason, however, was—as I think—that it displaced the Privy Council, which regarded itself as a sort of central health body, particularly in relation to epidemic diseases in respect of which it issued orders from time to time.

During the years the 1848 Act was in operation and the General Board of Health in existence a great amount of good was done and many local boards were set up. In spite of this, however, it disappeared, and the Privy Council once more became the central body. The local boards continued for some time longer, though they appear to have been in some places at loggerheads with some of the other bodies in their own area.

Early Health Officers.

One of the best things done by the Privy Council after they resumed the reins was the appointment of Dr., afterwards Sir John, Simon as medical officer. To take up this appointment Simon dropped that of medical officer of health of the City of London, a post created in 1848, of which he was the first holder. He was not, however, the first medical officer of health. Actually the first to hold this office in the country was Dr. Duncan, who was made medical officer of health of Liverpool in 1847 under a local Act of Parliament. The example set by Liverpool, and followed by the City of London, led to the appointment of medical officers of health in several other districts, and by 1856, in which year there were no fewer than 230 districts with a local board of health, each having power to make an appointment, there was quite a number of such officers.

In addition to making provision for the appointment of a medical officer of health, the 1848 Act provided for the appointment of other officers, the most important from our point of view being an inspector. To this officer there was given, in the first instance, the title of Inspector of Nuisances, and later of Sanitary Inspector, this being afterwards changed back to Inspector of Nuisances, and finally, we may hope, in the Public Health (Officers) Act, 1921, once again to Sanitary Inspector. In the 1848 Act, and to an extent also in other Acts to be mentioned later, the idea appeared to be that the officer most necessary was the inspector, the medical officer of health being brought in later for infectious disease purposes and to support the inspector in connexion with nuisances that might be dangerous to health, and something more than mere nuisances and eyesores. If this was the idea it did not quite work out, for in time the relative positions completely changed, the medical aspect of the work becoming more prominent, and the medically qualified taking the lead of the nuisance and sanitation officer as chief executive health officer.

The definite recognition and adoption of this principle in this country was made in the Public Health Act, 1875, in which one of the earliest duties imposed upon the local health authorities created by that Act was the appointment of a medical officer of health. Before this Act came into operation, however, many changes took place, while in the Act itself many new principles affecting health legislation and practice were developed and established. One of the most noteworthy happenings had been the relinquishment by the Privy Council of its position as central health body. When it gave up there was no return to the General Board of Health, its career having ended finally with the disappearance of the 1848 Act. The local boards of health had also suffered, as the view that health work was one of the ordinary activities of the district councils and not of the board of guardians or any ad hoc body came to be more widely accepted.

The Local Government Board.

To take the place of the General Board of Health and the Privy Council there was set up by a special Act of Parliament a body known as the Local Government Board, and as central authority for the bulk of health purposes it continued to function from the day of its formation until 1919 when, as everybody knows, the Ministry of Health was created, and unwept and unsung the old Board passed away, presumably for ever. By the time the Local Government Board was created Simon was practically ready to declare his task completed, by having the principle definitely recognised that in public health the function of a central body should be practically entirely supervisory and that of the local bodies executive. Himself a central body officer, he never ceased to enunciate this principle, and throughout the whole time he was acting as medical officer of the Privy Council, as he tells us himself, he was using every effort and opportunity to work up the local authorities not only of the ports (important because of cholera in the prevention of which he was particularly concerned) but elsewhere, to establish a complete health and preventive unit within their own area. In Simon's mind there is no doubt that what bulked most largely was preventive work, and what he really wanted to see was a complete system of dealing with infectious diseases, including hospital accommodation.

Chadwick, it always appears to me took a wider as well as a more humanitarian view, desiring to see conditions improved not only because he felt sure that by improving them he was clearing the breeding grounds of disease, but because he believed that the people would be bettered in health generally and in all other ways if their surroundings were improved. In a word, it was *social* improvement Chadwick desired to see, and it was because of this and because of the vast influence of Chadwick that our health legislation, that of early times certainly, and to an extent that of to-day also, is as much social as it is medical.

Legislation and Environmental Conditions.

The occurrence of cholera outbreaks and threats of others had heightened the demand amongst the people for provisions relating to health and sanitation. The provisions wanted were those most likely to prove effective, and as there appeared to be reason in both sets—those dealing with environmental and social conditions and those aimed more directly at disease prevention—it was eventually decided to have both.

Amongst environmental conditions those proposed to be dealt with included: (*a*) Sewerage and drainage; (*b*) water-supply; (*c*) nuisances; (*d*) offensive trades; (*e*) housing; (*f*) food protection.

Curiously, little absolutely new legislation was required in order to make provision for most of these matters. As already stated, in the 1848 Public Health Act, though its main intention was to provide for health organisation, a number of sections relating to sanitary matters were given a place. These dealt with sewerage and drainage, making it the duty of the local board set up under the Act to take over existing sewers and look after them and provide new ones; and in regard to drainage forbidding the erection of houses without water, drains, and sanitary conveniences. The duty of cleansing and scavenging was also imposed upon the board who were required further to see to the provision of a water-supply. In regard to general matters, power was given to call for the cleansing and purification of houses, for the registration of common lodging-houses, and to forbid the occupation of cellar dwellings. Provision was also made for controlling slaughter-houses and offensive trades.

Local Health Legislation.

In a number of districts steps had already been taken to ensure that environmental conditions in respect of at least the matters mentioned should be improved. Power to do so had in some cases been obtained under special "Local Acts," the cost of which had been borne by the areas to which they were applied. Parliament, indeed, had even gone so far as to provide "Model Acts" for the use of districts desirous of bringing about improvements and promoting Acts for themselves. The chief of the model Acts was that known as the Towns Improvement Clauses Act passed in 1847. In this there were contained a large number of sanitary provisions, of which several districts had availed themselves.

The principle of allowing and even encouraging local authorities to promote health legislation on their own account is still practised and recognised. Indeed, quite a number of the provisions now included in legislation applicable uniformly over the country was first tried in a small way in one area under a measure locally operative only. Notification of infectious diseases, for example, was introduced first locally in Huddersfield, and tuberculosis came to be added to the list of notifiable diseases only after Sheffield had obtained provisions calling for notification in that town. New provisions of this kind, if satisfactory, rarely remain limited in their application.

Nuisance and Disease Prevention.

In 1848, in addition to the Public Health Act, there was passed a measure of considerable importance—viz., the Nuisances Removal and Diseases Prevention Act, 1848. So far as nuisances were concerned this Act contained, in addition to a list of conditions that were to be regarded as nuisances, provisions relating to the methods to be adopted with a view to enforcing remedies and preventing recurrence. As to infectious disease, the chief provisions were those that gave power to the Privy Council to issue orders making the part of the Act relating to infectious diseases operative in certain areas and to the General Board of Health to issue directions and regulations as to the steps to be taken with a view to prevention. The Act, it may be noted, was very

cumbersome, operating only in districts to which it was applied. In 1849 it was amended and in 1855 it was transformed into two Acts, one relating to nuisances and the other to disease prevention. With perfect safety, indeed, it may be said that provisions very similar to those contained in that Act are still in operation, most of them having been incorporated in the Public Health Act, 1875, in which all existing health Acts were consolidated. This Act is still in operation, supplying the power under which the bulk of public health work done in England is carried out.

Special Acts.

Housing.—Acts dealing with other special subjects were passed at or about the same time, amongst which reference may be made to some relating to housing questions. The Common Lodging Houses Act of 1851 grew out of the 1848 Act itself and continued in operation for a number of years in places in which the 1848 Act applied. Later, its provisions were incorporated in the 1875 Public Health Act, later again to be extended by a number of fresh provisions in the Public Health Acts (Amendment) Act, 1907. Further, with regard to housing, it may be noted that in 1851 there was passed what may be taken to be the first Housing Act. This bore the title of the Labouring Classes Lodging Houses Act, and was followed by the Labouring Classes Dwelling Houses Act of 1866 and 1867. In 1868 the Artizans and Labourers Dwellings Act appeared, and in 1879 the Artizans and Labourers Dwellings Improvement Act. The first Housing of the Working Classes Act proper was passed in 1885, the first including town planning provision in 1909.

Generally speaking, the principle of these Acts appeared to be to induce and encourage local authorities to undertake the provision of housing accommodation themselves. In the later period they were strengthened by the offer of financial assistance out of national funds, and by the grant of powers to acquire land and premises compulsorily. Power was also given to interfere with existing property, altering it or requiring the owners to alter it with a view to encouraging overcrowding and disproving the view that it is impossible to squeeze a quart into a pint pot. In the earlier Acts there was no reference at all to overcrowding, and it was not till later Health Acts were passed that power to deal with the condition was given, and then only as a nuisance.

Water-supply.—In relation to water supply special legislation also became necessary and was in fact provided. Under the Public Health Act, 1848, it was made the duty of the local boards of health to take steps with a view to providing a proper supply for their district and in due course the provisions relating to this subject were incorporated in the Public Health Act, 1875, and are still in operation.

Food.—Provisions in public health Acts and sanitary Acts generally soon proved to be inadequate in regard to food-supply. A large amount of special legislation has been passed, some relating to foods generally, others to definite articles. Since 1875 there has been more or less of a steady flow of food legislation. Between that date and 1897 several Food and Drugs Acts were passed, some with the object of clearing up legal difficulties, others to make provision with regard to special substances.

Milk.—It was not till just about the outbreak of war that any real attempt was made to legislate with regard to other than the chemical aspects of milk. That it might be a vehicle for the conveyance of infection had been recognised in the Infectious Disease (Prevention) Act, 1899. It is also a fact that in 1912, by means of regulations, the practice of doctoring it by the addition of preservatives was forbidden. No real legislation, however, existed in which it was written down as a possible factor in the occurrence of tuberculosis amongst children; or described as a substance that must be produced and sold only in a clean condition. An Act bearing to some extent on these matters—The Milk and Dairies Act—was passed in 1914, but for one reason or other its operation has been postponed from time to time since then, and it is still in a state of suspended animation. By way of a *pis aller*, in 1922, what was called a Milk and Dairies (Amendment) Act, was passed, and this is now in operation.

Disease Prevention.—The objective of all health legislation is disease prevention even though the provisions only aim at improvement in environmental conditions. The very first disease prevention provisions were actually wedded to those relating to nuisance removal in the Nuisances Removal and Disease Prevention Act of 1848, the placing of nuisance removal first being perhaps not without significance. At the time when they were separated from nuisance removal in 1855, a great fight was raging over the question of quarantine, Simon eventually succeeding in getting rid of quarantine and substituting for it a system of examining crews and passengers on board ships, especially those from infected ports; isolation at the port of all found or suspected to be suffering from particular diseases, and supervision of all others, who were allowed to leave on giving their names and the address in the place to which they were proceeding.

It was in order that the supervision in any place within the kingdom might be complete that Simon desired to have a proper and uniform local health organisation in all areas, with machinery for dealing with disease, including hospital accommodation. It was as a result of his efforts, no doubt, that in the Public Health Act, 1875, in addition to the provisions taken from the Disease Prevention Act, there were introduced others relating to hospitals, removal and isolation of infected persons, and cleansing and disinfection of premises, both as a safeguard against the outbreak of disease and against spread of infection from an infected house, from an infected person, and from the contacts with such a person. The provisions with regard to disease prevention have been very little altered as time has gone on. In a word, it might be claimed that the principles of disease prevention were enunciated by Chadwick and Simon, and that they have never been departed from since.

Personal Hygiene and Preventive Medicine.

It is the tendency of public health in the present day to attempt to make out that everything possible has been done so far as environmental conditions are concerned, and that the time for concentrating on direct effort for the benefit of the individual, for seeing what can be done for and through him personally, has arrived.

There is a curious tendency to believe that Chadwick and Simon and all these other great ones (if, indeed, the bulk of health officials and workers ever think of them and their work at all) gave no consideration whatever to the individual. For my part, and having regard to the opinion I have formed of these men, I find it impossible to believe that with their keen sight they could have failed to recognise that personal hygiene, welfare work, and preventive medicine in their very widest sense possessed tremendous importance and must somehow or other and sometime or other be provided for. They recognised also, no doubt, the difficulty and hopelessness of tackling the individual in their own day, on account of the ignorance of the people; only a really well-informed people can be made to make themselves a healthy people.

It must have been obvious to Chadwick and Simon that the proper course was to concentrate upon matters urgently calling for attention—viz., such social and environmental conditions as could be improved without assistance from, and even in spite of, the people, leaving personal hygiene and preventive medicine in its narrower sense of direct action in relation to the individual for the future and for the health officers and enthusiasts who were to come after them. And to-day what are we doing more than merely extending the practice then introduced?

Welfare of Mothers and Children.

So far as school-children are concerned the important Acts are the Education (Administrative Provisions) Act, 1907, and the Education Act, 1918.

As regards infants the measures to be noted are those requiring notification of births to the medical officer of health, the first, which was adopted, passed in 1907, the second making the requirement generally applicable which came into operation in 1915. These Acts were really preliminary to the Maternity and Child Welfare Act, 1918, the most important of the group, since it provided for the setting up of committees to whom power to do practically anything likely to benefit infants and their mothers was given. The Acts relating to midwives and their practice may safely also be counted in with those designed to assist certain sections of the population though their efforts are less directly produced.

A Guide to Healthy Living.

All health legislation is based on principle and consists exclusively of principles. The things it directs and orders all of us to do or to have done or to see done are just those things that an individual of principle would regard as right. As a whole, as I have already stated, sanitary law is not really law but a series of rules; it is more, it is a guide to right living, healthy living for ourselves and for each other.

We have much to be thankful for, in that we possess incomparably the best health organisation in the world and a health code which, though it may have faults, such as that it is complicated, makeshift in parts, and full of compromises, is nevertheless reasonable, workable, and free from stunts. In the main it conforms to the basic principle underlying all or most of our legislation in that it represents the will of the people and not the views of cranks and experts. All of it practically has been considered and reconsidered, drafted and redrafted, pruned and criticised, tried and tested, by numbers of persons and bodies before it is put into general operation. But most important of all, our health laws are something more than printed words; few of them are dead letters, most of them can be and are worked, and none of them are "imposed." As a result of their working and the application of their underlying principles, have come, amongst other benefits, a reduction

of the death-rate amongst infants from well over 100 deaths per 1000 births to under 80 in the course of 12 or 15 years, and such an improvement in the health of the people generally that the average age at death has been considerably postponed, and the average death-rate in any one year reduced from over 20 per 1000 in the "seventies" to just over 12, the figure at which it stands to-day.

A REVISED SYLLABUS IN MATERIA MEDICA AND PHARMACOLOGY.

A REVISED synopsis of the examination in Pharmacology, Practical Pharmacy, and Materia Medica, which has been drawn up by the examiners to the Conjoint Board of the English Royal Colleges (Dr. A. E. Russell, Dr. E. A. Cockayne, Dr. P. Hamill, Dr. A. J. Clark, and Dr. W. E. Dixon) will come into force at the examination in October next. Candidates will be required to recognise the drugs and preparations in Schedule A. They will also be required to know the constitution and the chemical and physical properties of the drugs in Schedule B, in so far as these properties are of practical importance in medicine. Finally, they will be required to show a competent knowledge of the pharmacological action and doses of the drugs in Schedule B, and of the preparations of these drugs. Experimental evidence as to the mode of action of drugs, therapeutics, pharmacy, and pharmaceutical details as to the modes of preparation of drugs will form no part of the examination.

Schedule A.—Mercury subchloride, mercury with chalk, arsenious anhydride, arsenical solution, potassium permanganate, ferrous sulphate, iron and ammonium citrate, iodine, ether, chloroform, paraldehyde, amyl nitrite, aromatic spirit of ammonia, chloral hydrate, carbolic acid, camphor, liniment of camphor, quinine sulphate, opium, ergot, oil of turpentine, creosote, compound senna mixture.

Schedule B.—Ammonium carbonate, ammonium chloride, ammonium acetate; potassium carbonate, potassium bicarbonate, potassium citrate; sodium sulphate, acid sodium phosphate; magnesia, magnesium sulphate; calcium carbonate; silver nitrate; copper sulphate; zinc sulphate; lead acetate; alum; bismuth carbonate, bismuth oxychloride; barium sulphate; sodium hypochlorite, chloramine-T; iron, iron sulphate, iron perchloride, iron and ammonium citrate; potassium permanganate, hydrogen peroxide; mercury, mercury subchloride, mercuric chloride; arsenious anhydride; arsenobenzol, neoarsenobenzol; antimony tartrate; potassium bromide, potassium iodide, iodine, iodoform; hydrochloric acid, citric acid, caustic potash; gentian, calumba senega; croton oil, castor oil, phenolphthalein, cascara sagrada, aloes, senna, rhubarb, jalap, colocynth, sulphur, liquid paraffin; tannic acid, kino; male fern, santonin, pelletierine tannate, oil of chenopodium; cod-liver oil, dried thyroid, pituitary extract, adrenalin hydrochloride; colchicum; digitalis, strophanthus, squills; caffeine, theobromine, theocine; amyl nitrite, sodium nitrite, nitroglycerine; ipecacuanha, emetine; nux vomica, strychnine; opium, morphine, codeine, apomorphine; belladonna, atropine, hyoscine, homatropine; physostigmine; cocaine, ethocaine (novocaine); cinchona bark, quinine; rectified spirit, ether, chloroform, ethyl chloride, nitrous oxide; chloral hydrate, paraldehyde, barbitone; hexamine, oil of copaiba; ergot; carbolic acid, cresol, creosote; phenacetin, sodium salicylate, salol, acetylsalicylic acid; formaldehyde solution, paraform, menthol, camphor, thymol, oil of turpentine, cantharidin, mustard leaf.

PLAGUE PREVENTION IN JAVA.

AN illustration of the best form of publicity in the promotion of public hygiene is supplied by *Health*, a new monthly journal issued by the Commonwealth of Australia Department of Health, of which the second number (February, 1923) is concerned chiefly with plague prevention. Dr. J. S. C. Elkington, the chief quarantine officer of the North-Eastern division of the Commonwealth, contributes a graphic account of plague control in Java. In this tropical island the problem has been tackled by the Dutch Civil Medical Service with common sense and with clearness of vision, not hindered by the many difficulties of caste or religion. Investigation showed that spread from man to man was negligible as a factor, and the problem was reduced to the classical one of breaking the flea connexion between man and the very few species of rats which serve as reservoirs for human infection. Three species of rats—an "unholy trinity"—played this rôle, the most important one being the *Mus rattus griseiventa*, which is a strictly house rat, and cannot live a feral life in competition with the other prevailing species of rats. The problem, therefore, was one of rat-proofing houses and keeping them rat-proof. The means by which grass roofs were replaced by tiles and by which bamboo rafters were rendered rat-proof are given fully, and they are important as showing the practicability of the problems. The results were soon shown. As the Plague Prevention Service moved on plague disappeared in its track. Nothing was left to chance, and village by village the island is being rebuilt. In Dr. Elkington's words: "The Dutch authorities admit that it may take a long time and a great deal of money, but they refuse absolutely to accept plague as an ordinary feature of their colonial landscape in the twentieth century."

INSULIN: A SIMPLE EXPLANATION.

WE have received from the Therapeutic Foods Company (Energen Works, Willesden, London, N.W. 10) a small pamphlet outlining the rationale of the employment of insulin in the treatment of diabetes. The leading facts are well set out, as is the reasoning which has led up to the various steps of research and experiment. Proper emphasis is also laid upon the limits of our existing knowledge, the warning being distinctly given that there is no proof as yet that insulin is definitely a cure for diabetes. Its employment will not eliminate the necessity for dietary regulation.

PUBLIC HEALTH IN SEYCHELLES.

AT the census of April 24th, 1921, the population of Seychelles was returned at 24,523 (11,974 males and 12,549 females), showing an increase of 1832 on the figures of 1911. The birth-rate for 1921 was 28·91 and the death-rate 15·98 per 1000. An epidemic of whooping-cough caused many deaths among young children. There was also a slight influenza epidemic. In spite of its proximity to the equator, Seychelles is reputed to be one of the most healthy of the British possessions within the tropics. Its climate is mild and equable. The maximum shade temperature rarely exceeds 86° F., while at night the temperature seldom drops below 74°. Thus, during the whole year the temperature only varies over a range of about 12°. The rainfall averages about 90 inches.

DENTAL RESEARCH: A SUGGESTION TO DENTISTS.

AT the close of his admirable lecture on the Diseases of the Periodontal Tissues, reported in full in the *British Dental Journal* for April 2nd, Mr. J. Howard Mummery drew attention to the great desirability of increased activity in research among the members of the dental profession. There are, he said, so many difficult questions in the pathology of the teeth and the surrounding structures that call for further investigation and so few workers in the field; and he went on to make the practical suggestion that everyone in practice should keep at hand a bottle of 10 per cent. formol and place such specimens immediately in the solution for investigation by those who are able to give them the necessary time and attention. Many valuable examples would not then be lost to science, as they now are.

THE AXE FOR CRIPPLES.

THE Board of Education has recently issued a circular (No. 1297) to local education authorities and to managers of special schools, containing preliminary proposals for reduction of staff in special schools. Mr. Morgan Jones questioned the President of the Board in the House of Commons on the effect of these proposals. The drastic economy suggested will in fact limit the practical work in the majority of these schools, so that it will become little more than a phantom. The teaching staff for crippled, blind, and deaf children cannot be strictly rationed without negativing the whole conception on which this special education has been built up. We hope that the full provision of educational facilities for afflicted children will not be prejudiced by any short-sighted parsimony.

THE FITNESS OF FOOD-HANDLERS.

Kansas City, as we noted recently (THE LANCET, 1922, ii., 679), has been particularly active in seeing that its food is not subjected to gross risk in handling by diseased persons. In Texas the court of criminal appeal has now held valid an ordinance of the city of Dallas which provides that any person working in a "food establishment" must have a certificate stating that he has been examined by a "reputable physician" and found to be free from any communicable disease. This ordinance made proprietors of food establishments subject to medical examination, and the appellant whose appeal against a conviction, made in the form of an application for a writ of habeas corpus, was dismissed, was the proprietor of a meat market, and had been convicted of having worked in his own establishment without a health certificate. The equivalent in this country to an appeal of such a kind would be against a conviction under a by-law of a municipal authority, on the ground that it was *ultra vires*. The city of Dallas may be congratulated upon a very useful regulation, which might be studied and adapted far beyond its boundaries. In this country we have only to observe the conditions which surround the delivery of bread and milk to the consumer in order to appreciate the room there is for improvement in our precautions for the protection of the public health. The ordinance made by the city of Dallas, and upheld by its court, for "food establishments" apparently would provide against persons being carriers of disease who serve in any capacity in the markets where food is prepared and distributed, and in places where it is consumed, such as hotels and restaurants.